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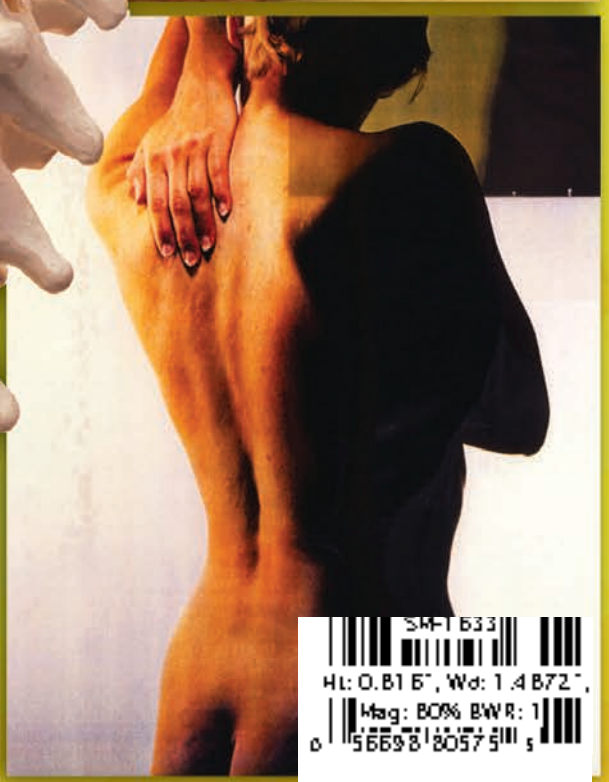

'Jane Doe' Legal Case Resolved

HOW TO 'HAUNT' A HOUSE

A Darwinian View of a Hostile Atheist

A JACKPOT OF CRACKPOTS

Creationism and Velikovsky

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Editor's Note

A Painful Legal Case Is Resolved in Favor of Open Inquiry

I hope everyone will read Carol Tavris's report in this issue on the resolution of a legal case that threatened critical investigation, academic research, freedom of inquiry, and freedom of speech. You may remember a special two-article investigative report published in our pages five years ago by psychological scientists Elizabeth Loftus and Melvin J. Guyer titled "Who Abused Jane Doe?" The object of that investigation, the unnamed Jane Doe, was displeased. She sued the authors and anyone else she thought had abetted their inquiry, sued the SKEPTICAL INQUIRER and even Tavris, who had written an accompanying SI report, "The High Cost of Skepticism." Five years of legal wrangling ensued, which was painful and costly for everyone. We've been able to say little about it, but the case has now been resolved. "Doe" (revealed by her filing to be Nicole Taus) lost resoundingly on twenty of the twenty-one counts. The SKEPTICAL INQUIRER's right to publish the articles was completely vindicated. Loftus, Guyer, and Tavris's right to talk and write about the case was protected, and the defendants, by winning an "overwhelming majority" of the claims, were entitled to recover fees and costs.

As Tavris writes in this issue, "It was a tremendous victory for open, skeptical inquiry and free speech." The California Supreme Court dismissed all counts against the defendants. It split on one single factual question involving only Loftus, a distinguished and courageous academic researcher. Tavris, who like Loftus is a CSI Fellow, explains all of this in detail in "Whatever Happened to 'Jane Doe'?"

* * *

Samuel Homola is a special kind of doctor of chiropractic—he is critical of the field. Specifically, he is critical of how the chiropractic profession keeps trying to extend itself from its one legitimate area of treatment—the treatment of some types of back pain by spinal manipulation—to wholly unverified claims that such manipulation can treat organic diseases. He gives a calm, reasoned appraisal of the situation in this issue.

Following that, we publish the report of an investigation by Bruce Thyer and Gary Whittenberger in Florida that reinforces Homola's concerns. They called the offices of twenty-eight chiropractors in Tallahassee and asked if they could treat high blood pressure and arthritis. Twenty-one of the twenty-eight said they could. A third report discusses another claimed medical remedy masquerading as science—homeopathy. Professor U. Kutschera of the Institute of Biology, University of Kassel, Germany, succinctly reviews the pseudoscientific assumptions of homeopathy and shows how "its closed, dogmatic system of fixed rules" is the exact opposite of real science.

* * *

As we were wrapping up this issue, news organizations reported that the White House had made deep editorial cuts in written testimony to a Senate committee by the director of the Centers for Disease Control and Prevention. The cuts diluted her warnings of the health risks posed by global warming. Although some depicted this as normal vetting, it appears to be another in a regrettably long list of such actions by the White House to water down scientific reports and testimony—on climate change and many other areas of science—that come to conclusions uncomfortable to the administration.

—KENDRICK FRAZIER

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Difficulty in Debunking Myths Rooted in the Way the Mind Works

SHANKAR VEDANTAM

The federal Centers for Disease Control and Prevention recently issued a flier to combat myths about the flu vaccine. It recited various commonly held views and labeled them either "true" or "false." Among those identified as false were statements such as "The side effects are worse than the flu" and "Only older people need flu vaccine."

When University of Michigan social psychologist Norbert Schwarz had volunteers read the CDC flier, however, he found that within thirty minutes, older people misremembered 28 percent of the false statements as true. Three days later, they remembered 40 percent of the myths as factual.

Younger people did better at first, but three days later they made as many errors as older people did after thirty minutes. Most troubling was that people of all ages now felt that the source of their false beliefs was the respected CDC.

The psychological insights yielded by the research, which has been confirmed in a number of peer-reviewed laboratory experiments, have broad implications for public policy. The conventional response to myths and urban legends is to counter bad information with accurate information. But the new psychological studies show that denials and clarifications, for all their intuitive appeal, can paradoxically contribute to the resiliency of popular myths.

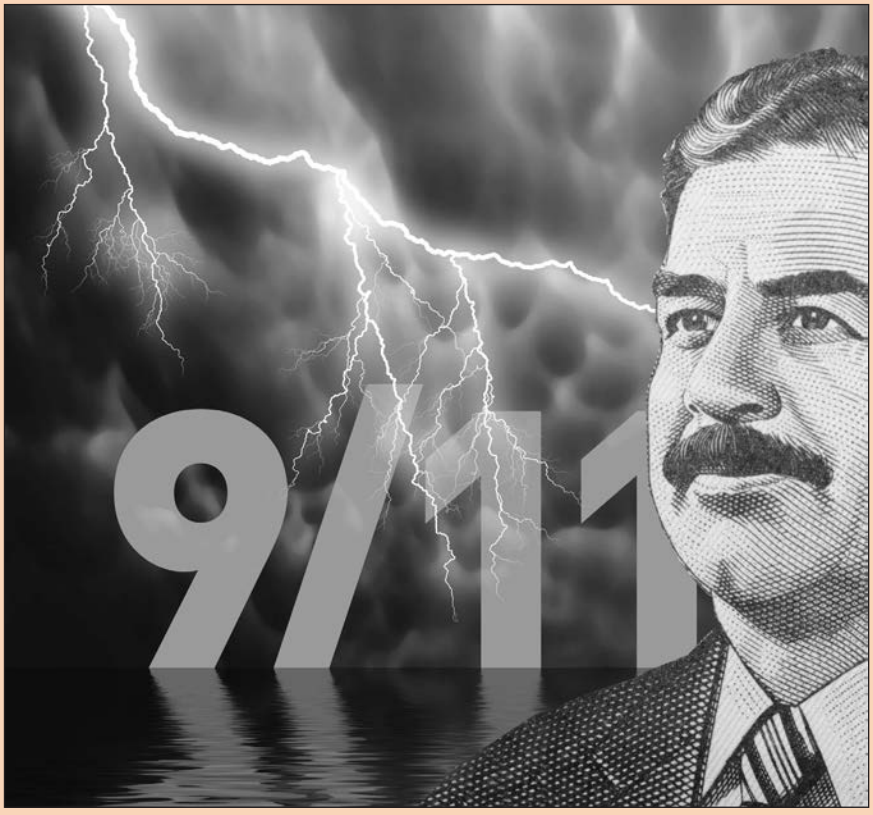
This phenomenon may help explain why large numbers of Americans incorrectly think that Saddam Hussein was directly involved in planning the September 11, 2001, terrorist attacks, and that most of the September 11 hijackers were Iraqi. While these beliefs likely arose because Bush administration officials have repeatedly tried to connect Iraq with September 11, the experiments suggest that intelligence reports and other efforts to debunk this account may in fact have helped keep it alive.

Similarly, many in the Arab world are convinced that the destruction of the World Trade Center on September 11 was not the work of Arab terrorists but was a controlled demolition; that four thousand Jews working there had been warned to stay home that day; and that the Pentagon was struck by a missile rather than a plane.

Those notions remain widespread even though the federal government now runs Web sites in seven languages to challenge them. Karen Hughes, who ran the Bush administration's campaign to win hearts and minds in the fight against terrorism, recently painted a glowing report of the "digital outreach" teams working to counter misinformation and myths by challenging those ideas on Arabic blogs.

A report last year by the Pew Global Attitudes Project, however, found that the number of Muslims worldwide who do not believe that Arabs carried out the September 11 attacks is soaring—to

This phenomenon may help explain why large numbers of Americans incorrectly think that Saddam Hussein was directly involved in planning the September 11, 2001, terrorist attacks.



59 percent of Turks and Egyptians, 65 percent of Indonesians, 53 percent of Jordanians, 41 percent of Pakistanis and even 56 percent of British Muslims.

Research on the difficulty of debunking myths has not been specifically tested on beliefs about September 11 conspiracies or the Iraq war. But because the experiments illuminate basic properties of the human mind, psychologists such as Schwarz say the same phenomenon is probably implicated in the spread and persistence of a variety of political and social myths.

The research does not absolve those who are responsible for promoting myths in the first place. What the psychological studies highlight, however, is the potential paradox in trying to fight bad information with good information.

Schwarz's study was published this year in the journal *Advances in Experimental Social Psychology*, but the roots of the research go back decades. As early as 1945, psychologists Floyd Allport and Milton Lepkin found that the more often people heard false wartime rumors, the more likely they were to believe them.

The research is painting a broad new understanding of how the mind works. Contrary to the conventional notion that people absorb information in a deliberate manner, the studies show that the brain uses subconscious "rules of thumb" that can bias it into thinking that false information is true. Clever manipulators can take advantage of this tendency.

The experiments also highlight the difference between asking people whether they still believe a falsehood immediately after giving them the correct information and asking them a few days later. Long-term memories matter most in public health campaigns or political ones, and they are the most susceptible to the bias of thinking that well-recalled false information is true.

The experiments do not show that denials are completely useless; if that were true, everyone would believe the myths. But the mind's bias does affect many people, especially those who want to believe the myth for their own reasons, or those who are only peripherally interested and less likely to invest the time and effort needed to firmly grasp the facts.

The research also highlights the disturbing reality that once an idea has been implanted in people's minds, it can be difficult to dislodge. Denials inherently require repeating the bad information, which may be one reason they can paradoxically reinforce it.

Indeed, repetition seems to be a key culprit. Things that are repeated often become more accessible in memory, and one of the brain's subconscious rules of thumb is that easily recalled things are true.

Many easily remembered things, in fact, such as one's birthday or a pet's name, are indeed true. But someone trying to manipulate public opinion can take advantage of this aspect of brain functioning. In politics and elsewhere, this means that whoever makes the first assertion about something has a large advantage over everyone who denies it later.

Furthermore, a new experiment by Kimberlee Weaver at Virginia Polytechnic Institute and others shows that hearing the same thing over and over again from one source can have the same effect as hearing that thing from many different people—the brain gets tricked into thinking it has heard a piece of information from multiple, independent sources, even when it has not. Weaver's study was published this year in the *Journal of Personality and Social Psychology*.

The experiments by Weaver, Schwarz and others illustrate another basic property of the mind—it is not good at remembering when and where a person first learned something. People are not good at keeping track of which information came from credible sources and which came from less trustworthy ones, or even remembering that some information came from the same untrustworthy source over and over again. Even if a person recognizes which sources are credible and which are not, repeated assertions and denials can have the effect of making the information more accessible in memory and thereby making it feel true, said Schwarz.

Experiments published in the *Journal of Experimental Social Psychology* in 2004 by Ruth Mayo, a cognitive social psychologist at Hebrew University in Jerusalem, also found that for a substantial number of people, the "negation tag" of a denial falls off with time. "If someone says, 'I did not harass her,' I associate the idea of harassment with this person," said Mayo, explaining why people who are accused of something but are later proved innocent find their reputations remain tarnished. "Even if he is innocent, this is what is activated when I hear this person's name again. If you think 9/11 and Iraq, this is your association, this is what comes in your mind," she added. "Even if you say it is not true, you will eventually have this connection with Saddam Hussein and 9/11."

Mayo found that rather than deny a false claim, it is better to make a completely new assertion that makes no reference to the original myth. Rather than say, as Sen. Mary Landrieu (D-La.) recently did during a marathon congressional debate, that "Saddam Hussein did not attack the United States; Osama bin Laden did," Mayo says it would be better to say something like, "Osama bin Laden was the only person responsible for the September 11 attacks"—and not mention Hussein at all.

The psychologist acknowledged that such a statement might not be entirely accurate—issuing a denial or keeping silent are sometimes the only real options.

So, is silence the best way to deal with myths? Unfortunately, the answer to that question also seems to be no. Another recent study in the *Journal of Applied Psychology* by Peter Kim, an organizational psychologist at the University of Southern California, found that when accusations or assertions are met with silence, they are more likely to feel true.

Mythbusters, in other words, have the odds against them.

Shankar Vedantam is a staff writer for the Washington Post*, where this article originally appeared.* *Copyright 2007, the* Washington Post. *Reprinted with permission.*

Haunting Evidence Follow-Up: TV Psychic Detectives Fail Again

In the September/October 2006 issue of SKEPTICAL INQUIRER, I reported on a Court TV "reality" show, *Haunting Evidence*. The series follows three investigators as they revisit real-life cold murder cases, hoping to succeed where police had failed. Carla Baron (touted as a "psychic profiler") is joined by New Age bookstore owner (and "highly esteemed medium") John J. Oliver, and Patrick Burns, founder of Ghost Hounds paranormal investigation network.

If the *Haunting Evidence* psychics can provide valid, reliable evidence that leads police to suspects and solves crimes, they should be used in every police department. But psychics' claims often don't live up to reality, and I promised a follow-up at the end of the first season to see how many cases the psychic team had solved.

In one high-profile episode, the group went to Athens, Georgia, to look into the unsolved 2001 murder of college student Tara Baker. The trio visited the Baker family, camera crew in tow, and asked them to relive their daughter's death. Oliver, the medium, stated that the police already have the DNA evidence they need to find Baker's murderer and that he will be caught. The team turned over a sketch of the murderer to the Athens police. That was over a year ago, yet Baker's murder remains unsolved, and according to the Baker family's Web site there is "still no progress toward solving Tara's murder."

A member of Tara Baker's family contacted me about the *Haunting Evidence* team's intrusion into their family tragedy and provided an interesting glimpse into the family's point of view. He stated, "'Psychic' investigators and the producers of such programs feed on the emotions of people in real tragedies. . . . The only reason we agreed to do the show was because the case is completely stalled and the initial investigations [were] so severely botched. . . . The worst thing about this experience is when people come up to me and commend my family for doing the show, telling me what a brilliant psychic Carla Baron is. . . . [T]hat woman was a real fruit loop." (The Baker family's comments about psychics and their reservations about participating in the show were of course edited out of the episode that aired.)

So Tara Baker's murder remains unsolved, and her family was less than impressed by the "psychics." But that's only one failure; how many of the eight other cases featured in the first season of *Haunting Evidence* did the team solve?

Not a single one. Zero.

In any other profession, a success rate of zero means you have utterly failed; you can't do whatever it is you claim to do, and you should admit it, pack it up, and go home. Yet despite their fully documented complete lack of success, the series was renewed for a second (and possibly third) season. I was hoping at the end of season one to see a follow-up episode in which the team would profile their many successes, congratulate themselves for helping families and solving crimes, and gloat about having shown up the skeptics. That show was never scheduled.

How many of the . . . cases featured in the first season of *Haunting Evidence* did the team solve? Not a single one. Zero.

While almost all of the murderers remain at large, at least one of the cases has since been solved: that of slain New Mexico State University student Katie Sepich. Sepich was assaulted and killed in 2003, her body left in a dump in Las Cruces, New Mexico. *Haunting Evidence* asked, "With the case stalled and a sexual predator at large in a college town, can the team of paranormal investigators fill in the holes in the Sepich case?" Patrick Burns mentioned the Sepich case as a success in a September 20, 2007, post on his Web site: "I am often asked will there ever be follow-up episodes for any resolutions in these cases? There already has been! The Katie Sepich case from season one has been resolved. . . . You will be amazed by the details and accuracy that John J. Oliver hit on for this one!" Burns certainly makes it sound like the *Haunting Evidence* team solved the case and brought the killer to justice.

However, according to District Attorney Susana Martinez, the case was solved by science, not psychics. Gabriel Avila, a convicted felon serving time for unrelated crimes, confessed to killing Sepich after police matched his DNA to a sample found on Sepich's body. In reports of the arrest, there was no mention of any useful information provided by Oliver, Burns, or Baron—certainly nothing that led police to Avila or solved the case—and it's remarkable that Burns would suggest his team deserves credit for an arrest brought about by police work and DNA analysis.

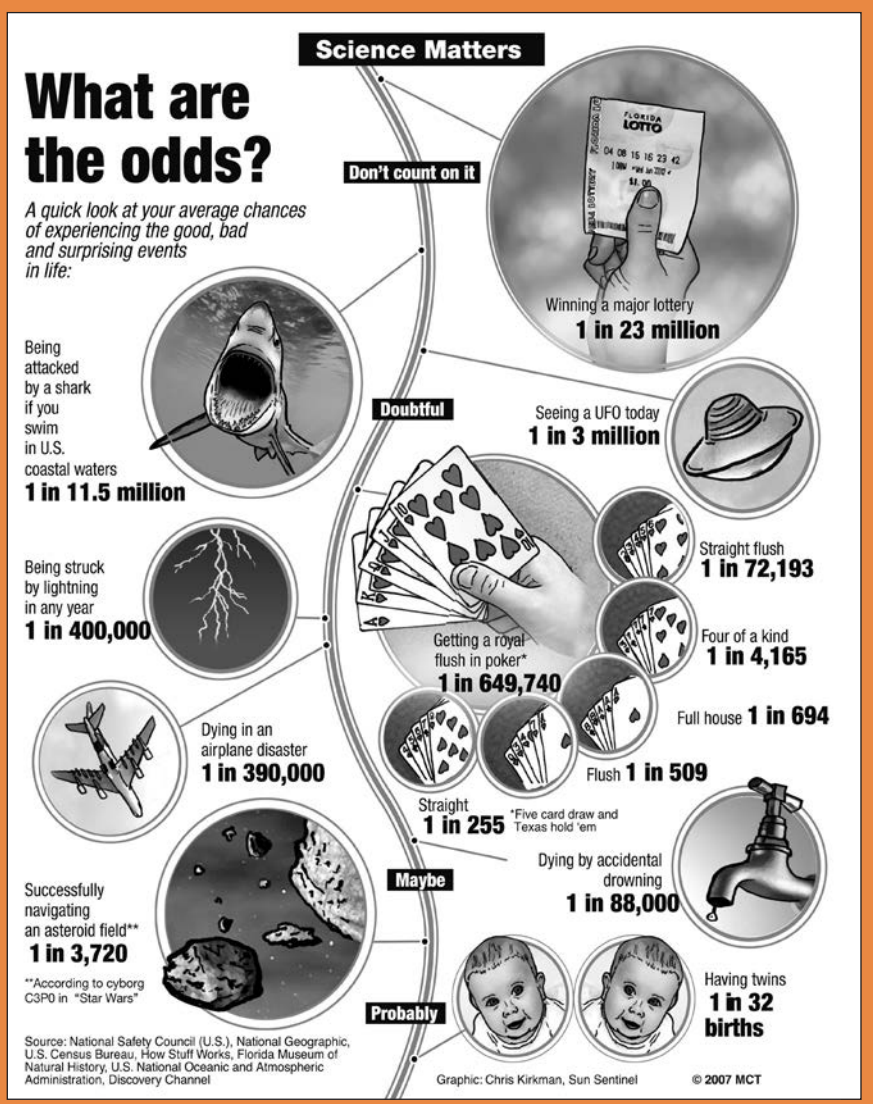
On its Web site, Court TV recently polled its viewers, asking, "Two seasons of *Haunting Evidence* are now complete. Do you feel the show has contributed to help solve the featured cases?" Incredibly, two-thirds of the respondents (62 percent) voted "Yes; the team has certainly disclosed much new information," while 37 percent voted "No, we still don't know most of the killers." It's clear that many audience members have a shaky grasp of logic and assume that if the *Haunting Evidence* team gives information—any information, correct, incorrect, previously known, or unverifiable—to police, that counts as some sort of success. To police, the victims' families, and skeptics, the results speak for themselves: Either the information provided by the psychics helped solve the cases, or it didn't. Carla Baron and the other high-profile investigators have had a chance to prove their powers and solve crimes on camera in the public eye. In every single case, they have failed.

Baron, in a press release about the series, stated that the main complaint she has gotten from the series executives was not her failure, but that she solved the cases too quickly!

Baron wrote, "The producers did keep having to slow me down. 'Carla,' they'd say, 'we don't want you to solve this case in three minutes. The show will be over too quickly.'" The *Haunting Evidence* team seems satisfied with their work despite their obvious failures, and why not? Court TV gets high ratings while Carla Baron, Patrick Burns, and John Oliver get payment and publicity. Yet there is no satisfaction for the victims' families who have been used as entertainment fodder yet are still waiting for justice and closure.

—Benjamin Radford

Benjamin Radford is managing editor of the SKEPTICAL INQUIRER *magazine and the "Bad Science" columnist for Live Science.com.*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Getting a royal flush in poker*
1 in 649,740
Four of a kind
1 in 4,165
Full house 1 in 694
Dying in an airplane disaster
1 in 390,000
Flush 1 in 509
Straight
1 in 255
*Five card draw and Texas hold 'em
Dying by accidental drowning
1 in 88,000
Maybe
Successfully navigating an asteroid field**
1 in 3,720
**According to cyborg C3P0 in "Star Wars"
Having twins
1 in 32 births
Probably
Source: National Safety Council (U.S.), National Geographic, U.S. Census Bureau, How Stuff Works, Florida Museum of Natural History, U.S. National Oceanic and Atmospheric Administration, Discovery Channel
Graphic: Chris Kirkman, Sun Sentinel
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Weekly Science Matters graphic: the average probability of various good, bad, and unexpected events in life. Sun Sentinel 2007.

Council of Europe Approves Resolution against Creationism

On October 4, 2007, the Council of Europe's Parliamentary Assembly approved a resolution recommending that its member governments oppose the teaching of creationism as science. In June, an earlier attempt at approving a resolution entitled "The Dangers of Creationism in Education" had failed. The revised and approved resolution 1580/2007 now states, "The prime target of present-day creationists, most of whom are Christian or Muslim, is education. Creationists are bent on ensuring that their ideas are included in the school science syllabus. Creationism cannot, however, lay claim to being a scientific discipline." The resolution also comprises intelligent design, which is described as a more refined version of creationism.

Noting the religious roots of creationism, the resolution stresses that "the aim of this report is not to question or to fight a belief. . . . The aim is to warn against certain tendencies to pass off a belief as science." Of particular concern is the fact that "the war on the theory of evolution and on its proponents most often originates in forms of religious extremism which are closely allied to extreme right-wing political movements. The creationist movements possess real political power. The fact of the matter . . . is that some advocates of strict creationism are out to replace democracy by theocracy."

The resolution urges keeping science and religion separate in education. "There is a real risk of a serious confusion being introduced into our children's minds between what has to do with convictions, beliefs, ideals of all sorts and what has to do with science. An 'all things are equal' attitude may seem appealing and tolerant, but is in fact dangerous. . . . In the name of freedom of expression and individual belief, creationist ideas, as any other theological position, could possibly be presented as an addition to cultural and religious education, but they cannot claim scientific respectability."

The resolution ends by urging the forty-seven member states of the Council of Europe, especially their education authorities, to:

1. Defend and promote scientific knowledge;

2. Strengthen the teaching of the foundations of science, its history, its epistemology and its methods alongside the teaching of objective scientific knowledge;

3. Make science more comprehensible, more attractive, and closer to the realities of the contemporary world;

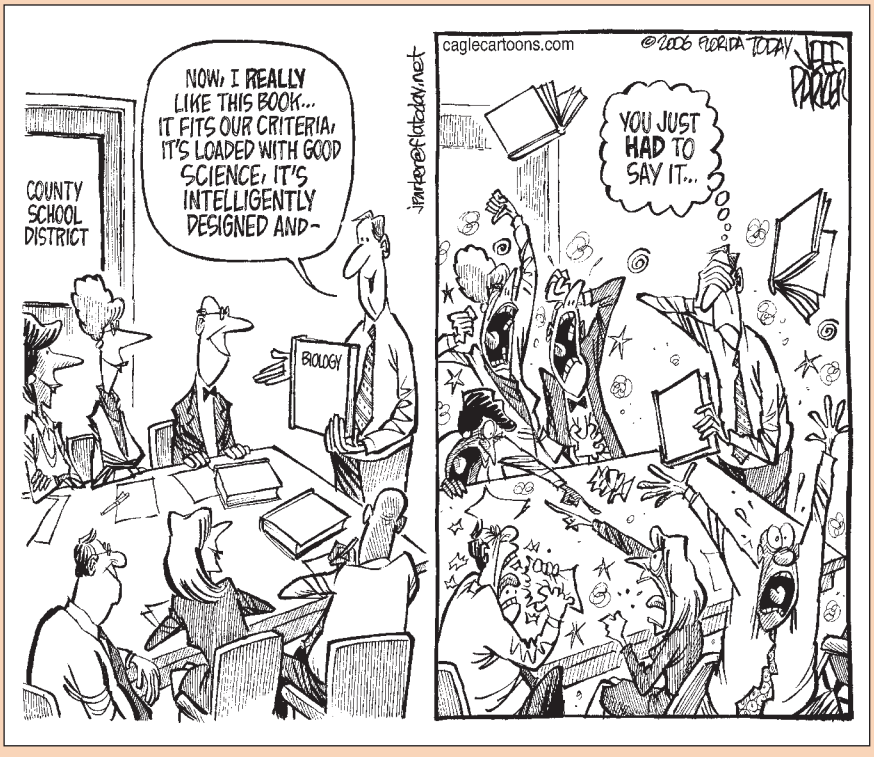
4. Firmly oppose the teaching of creationism as a scientific discipline on an equal footing with the theory of evolution and in general resist presentation of creationist ideas in any discipline other than religion;

5. Promote the teaching of evolution as a fundamental scientific theory in the school curriculum.

The resolution is not binding on the Council's member states. The function of the Council of Europe is to oversee human rights standards in member states and enforce decisions of the European Court of Human Rights. For more information or to read the text of the resolution, seehttp://assembly.coe.int/Main.asp?link=/Documents/AdoptedText/ta07/ERES1580.htm.

—Martin Mahner

Martin Mahner is the head of Center for Inquiry/Europe.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Exciting UFOs Become Bland IFOs

Reports of UFOs—unidentified flying objects—continue to pour in from various locales around the world. While they are popularly believed to be extraterrestrial craft, or "flying saucers," most eventually become IFOs—identified as planes, balloons, meteors, or other objects, or even as illusions or hoaxes.

While it may take only a few moments for someone to report a UFO, it may take weeks or years for the data to surface that could explain it. Those in the business of promoting UFOs are unfazed by the constant UFO-to-IFO transformation, since there is always a residue of old cases to tout, as well as a constant supply of new ones with which to mystify a credulous public.

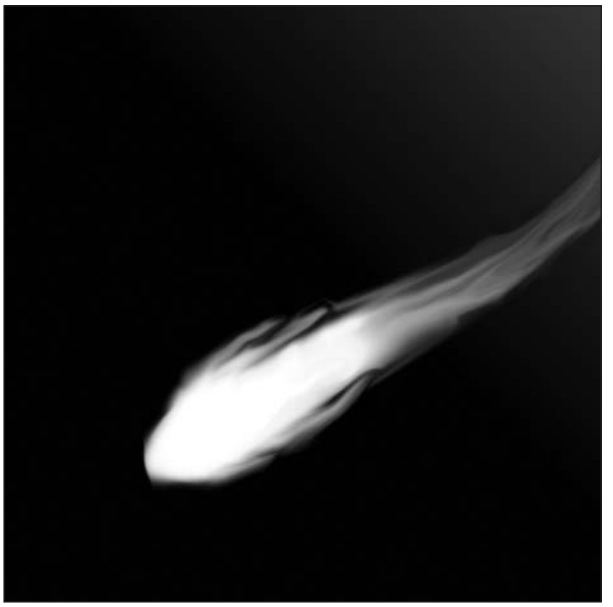

Illustration of a meteor entering the atmosphere. (Credit: Shutterstock)

Unidentifieds . . .

Here are a few of the UFO mysteries that came across my desk in 2007—cases that readers may wish to try their hand at solving before learning how the sightings were ultimately converted to IFOs. One is a case I personally reviewed for a major television show.

• An unidentified airborne craft was shown in a photo posted on the Ufodigest Web site by someone calling himself "Gaston." The picture was supposedly snapped over Buenos Aries, Argentina, on May 2, 2007, at about 5 in the afternoon. *Ufodigest*'s Dirk Vander Ploeg said Gaston "is confident the image is not of an aircraft but in all truthfulness he is not sure what it is" (Vander Ploeg 2007a). Some saw pixilation around the object that they thought indicated Photoshop computer fakery, but another blogger, noting that a roof shown in the image was similarly pixilated, explained: "That's an effect most digital cameras have when photographing objects against a very bright background during daylight" (Cohen 2007). Was the UFO real or fake?

• Sightings of a mysterious silver-colored, rocket-like UFO silently hovering above Salt Lake City were reported in June. The object was estimated at approximately one hundred feet long. And, although seen by dozens of eyewitnesses, it was not picked up on radar, according to air traffic controllers at Salt Lake City International Airport (Moseley 2007; 'UFO' 2007). What were people seeing?

• On Wednesday, July 25, a group of Millington, Tennessee, residents were perplexed to see a large, dark, ring-like object floating in the sky. "It stayed stationary, no lights or anything like that. Stayed there for 20, 30 minutes and then it just started disappearing," said one woman who snapped several photos in the meantime. Notions of what the photographed object might have been ranged from water on the camera lens to "a spaceship with a cloaking device" (Kenney 2007). Whatever it was, it was not something dozens of e-mailers had ever seen before. What could it have been?

. . . Become Identifieds

Soon, each of these UFOs yielded up its secrets. The Argentinean photo turned out to be genuine after all, but the UFO was not: it was what I long ago termed an "unidentified Frisbee object"—that is, a model flung into the air so that its picture could be quickly snapped (Nickell 1994, 163–164). In this instance, the model was identified by James Carrion, international director of the Mutual UFO Network (MUFON), as one of a series of the "fictional mecha" in the Metal Gear series of video games (Vander Ploeg 2007b).

The Salt Lake City hovering UFO turned out to have been a small remote-controlled blimp only thirty feet long, less than a third of the UFO's estimated size. The craft was being developed by a local resident named Daniel Geery, who said he had made more than six hundred of the blimps over more than a decade. Geery's blimp lost power, eventually went down, and was retrieved

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by a worker in the area (Moseley 2007).

The third UFO, the dark, doughnut-shaped object in Tennessee, turned out to have been a carbon smoke ring. It was a byproduct of a gas bomb set off by a crew from High Tech Special Effects who had been shooting pyrotechnics for a television special. Because of a lack of wind that day, the smoke ring hung in the air for a relatively long time, according to the special effects operator (Kenney 2007).

As these cases illustrate, UFOs may well become IFOs with the expenditure of sufficient effort—or the advent of good luck. Sometimes, as in the following case I studied, one can reach through the "noise" to obtain the clues needed for a probable identification.

Fiery UFO

The case began around 8 P.M. on Wednesday, January 24, when a UFO was seen by numerous people in the American southeast. It was watched by eyewitnesses from Greer, South Carolina, to Asheville, North Carolina, some of whom dialed 911 to report the sighting.

I was subsequently asked by a major CNN television show, *Anderson Cooper 360*, to give my opinion of the UFO. The segment aired late in the evening of February 6, after I had spent several hours studying the available evidence in the case.

On the same program, George Lund of the Mutual UFO Network noted that—because the North Carolina sighting occurred near a nuclear power plant—some people felt that extraterrestrials might be "coming in that area maybe to feed off some of the energy that plant is producing" (Lund 2007). However, I had a simpler explanation.

Several eyewitnesses' descriptions had been given in online news stories, providing characteristics of the UFO that aided in its probable identification.

1. *The object was fiery.* It was described as resembling "a glowing flare" or being "like a shooting star." One person stated, "It was like a ball that grew a tail," and another compared it to "a comet coming down" (Dick 2007).

2. *The light was bright, and bluish-to greenish-white.* Eyewitnesses stated it was "a really bright light" and "brighter than a plane," and that it was "a greenish-like light," "a bright green light," and "a blue/green light" ("Reader" 2007).

3. *The duration was brief.* "It was visible for about, oh, 10–15 seconds," one person reported (Dick 2007), while another stated it "disappeared within seconds." Another said, "I saw it for a couple of seconds, and then just like fireworks, it started to blink and then disappeared" ("Reader" 2007).

4. *Some thought it resembled an aircraft going down.* One man related that he and his children "really thought a small plane or helicopter was going to crash at first" ("Reader" 2007). Another man had a similar impression but, being a former military pilot, realized the colors were different than those of a crashing plane (Dick 2009).

Now, UFOlogists typically classify UFOs by a six-category system posited by J. Allen Hynek: nocturnal lights, daylight discs, radar-visuals, and three categories of "close encounters" (those of very close proximity [less than 500 feet], those having physical effects on the environment, and those having "occupants" associated with them). (See Hendry 1979, 7–12.) Obviously, the Carolinas' UFO falls into the first category.

Among the nocturnal-light IFOs are celestial bodies, satellites, aircraft, and balloons, as well as flares and other "UFO impostors" including meteors and re-entry of man-made material, e.g., satellites and rocket bodies. Of the latter—objects burning up on entering (or re-entering) earth's atmosphere—meteors are most common and may be seen at any time of the year and at any hour of the night (Hendry 1979, 24–56).

Consistent with the Carolinas' UFO, a meteor will often have a bright appearance, with or without a trail, and may be of any color, even green. Witnesses often describe one as like a "comet" or "downed plane." A meteor can be of "any continuous trajectory," and its duration usually ranges from one to twenty seconds (Hendry 1979, 41–44).

Considering all the reported features of the Carolinas' UFO, I identified it as a probable meteor. The same conclusion was reached by a meteorologist (Kramer 2007) and an astronomer (*Anderson Cooper 360* 2007). I did tell Anderson Cooper whimsically that if it really was an extraterrestrial craft it appeared to have burned up on entry, and that in the future the aliens should take corrective measures before again approaching Earth (Nickell 2007).

Meanwhile, UFOs will continue to be reported as long as people look at the skies. Not all will be identified, but proponents must realize that merely touting unidentifieds does not in any way imply that they are extraterrestrial craft. To suggest that is to engage in a logical fallacy called arguing from ignorance; that is, one cannot draw a conclusion from a lack of knowledge. What is needed is clear, positive evidence of alien visitation, and so far that is lacking.

Acknowledgments

I am grateful to CFI's Assistant Director of Communications, Henry Huber, for keeping me posted on matters of paranormal newsworthiness, including UFO sightings.

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Is Intelligent Design Creationism?

Intelligent design proponents such as William Dembski claim that science is incomplete because it doesn't admit the possibility of "explaining" the world by invoking the action of a (supernatural) designer. (Dembski usually shies from overtly calling for a supernatural designer, but since natural design is already accepted as part of the explanatory framework of science—for example in the case of the Search for Extraterrestrial Intelligence—his shyness must be only a political expedient.) And yet, it is demonstrably the case that Dembski doesn't understand (or refuses to understand for psychological reasons) how partly historical sciences such as evolutionary biology actually work (see *Thinking About Science*, SI July/August 2005).

As an example, let us consider a standard objection to evolutionary theory that Dembski presents at every occasion (e.g., in his "The Logical Underpinning of Intelligent Design," a chapter in Dembski and Ruse's *Debating Design*, Cambridge University Press). In discussing naturalistic scenarios for the evolution of complex biological structures, such as the bacterial flagellum, Dembski claims that the following conditions must be met: "(a) the probability of each step in the series [of evolutionary changes leading to a complex structure] can be quantified, (b) the probability at each step turns out to be reasonably large, and (c) each step constitutes an advantage to the evolving system."

Sounds reasonable, right? Not really. Any biologist (beginning with Darwin) would agree on *c*, though often we simply do not know enough about the structural biology and history of a given structure to be able to give a *full* list of steps (more on this below); *b* is rather obvious; the real problem is *a*. Dembski here sets the bar so high that he knows it cannot reasonably be met, which means of course that he wins by default. The situation is rather analogous to that of a classic creationist claim, which is why I think the logic of ID is not significantly different from the logic of creationism in general. One of the recurring objections that creationists raise to evolutionary theory is that, in their opinion, there are no intermediate fossils to make a convincing case that, say, *Homo sapiens* really did evolve from a closely related group of primates. A patient paleontologist will then produce several fossils of different species of *Australopithecus*, together with many species of pre-*sapiens Homo*, all perfectly good candidates as intermediates. "Ah!" the creationist cries in disbelief, "but now you have many more gaps to explain!"

The fossils produced by the paleontologist make a compelling case because they are of the appropriate morphology and because they are found in the temporal sequence predicted by evolutionary theory.

This response is not a joke, I have actually heard plenty of creationists making it

Massimo Pigliucci is professor of evolutionary biology and philosophy at Stony Brook University in New York, a fellow of the American Association for the Advancement of Science, and author of Denying Evolution: Creationism, Scientism and the Nature of Science. *His essays can be found at www.rationallyspeaking.org.*

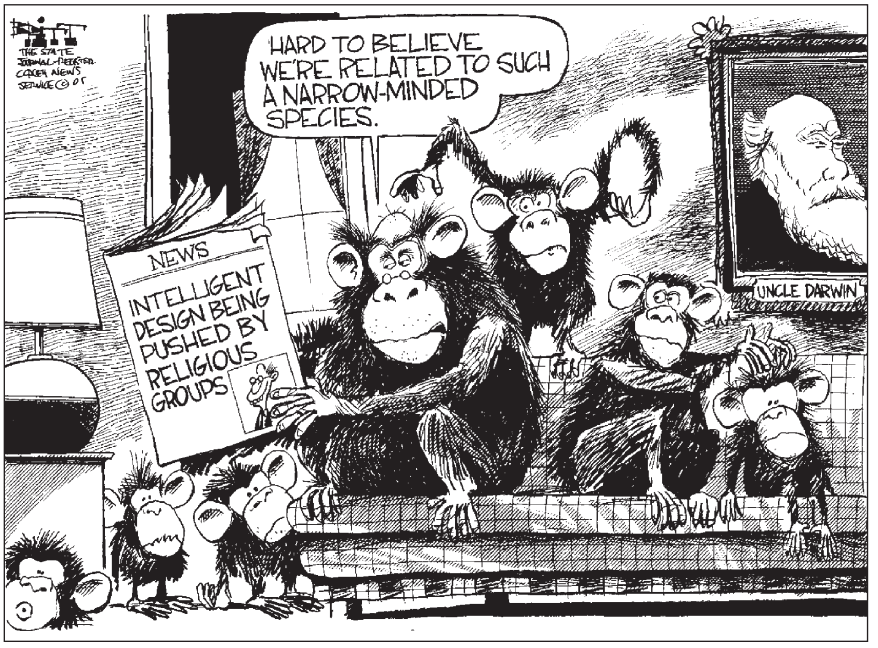
with the clear impression of having definitely trumped my materialistic delusions (and, I suspect, expecting me to kneel in front of them to accept Jesus). The fault in the logic should be obvious: the fossils produced by the paleontologist make a compelling case because they are of the appropriate morphology (i.e., they do show intermediate characteristics between the most ancient and the most recent species), and because they are found in the temporal sequence predicted by evolutionary theory. While any individual fossil does not clinch the case, the entire ensemble allows scientists to make what philosophers call an "inference to the best explanation": the idea that *Homo sapiens* evolved by successive modifications from primate ancestors is made increasingly more likely with every *Australopithecus* and pre-*sapiens Homo* fossil that is found. This, incidentally, was exactly the type of argument used by Darwin in *The Origin of Species*, which is why he famously referred to it as "one long argument" (the longer, the more convincing).

The idea that *Homo sapiens* evolved by successive modifications from primate ancestors is made increasingly more likely with every *Australopithecus* and pre-*sapiens Homo* fossil that is found.

Dembski, in asking for condition *a* is asking for the same sort of thing that standard creationists want when they demand a minute-by-minute account of evolution. He knows very well that the demand is impossible to fulfill for the same reasons that we cannot produce every single intermediate change that actually occurred during the evolution of *Homo sapiens*: evolutionary biology is a historical science, and the historical traces of many of the relevant events are forever lost to science. This doesn't mean that the inference to the best explanation isn't a powerful tool of scientific investigations. Indeed, many ID proponents themselves use precisely such a tool in claiming that the available facts "point" in the direction of an intelligent designer as the *best* explanation for the complexity of living organisms.

That said, sometimes biologists do get lucky enough to actually be able to show, both theoretically and by comparative anatomy, all or almost all the intermediate steps that may have occurred to bring about the evolution of a given complex structure. This is the case for the vertebrate eye, as beautifully summarized in a classic paper co-authored by legendary evolutionary biologist Ernst Mayr (Salvini-Plawen and Mayr 1977; see also Nilsson and Pelger 1994). We now have both a set of computer simulations showing how the complex vertebrate eye can evolve from simple photoreceptors, and a collection of currently living organisms actually displaying many of the predicted forms (all perfectly functional, which answers the classical creationist question of "what is half an eye good for?").

As the informed reader might recall, the vertebrate eye used to be the quintessential example of "irreducible complexity" and a famous warhorse of intelligent design theory at the time of William Paley (early nineteenth century). It is not by chance (shall we call it rhetorical design?) that modern ID proponents such as Michael Behe and Dembski never mention the eye and instead retreat to the depth of microscopic structures such as the bacterial flagellum. Should we be able to do for the flagellum what we did for the eye, what would the next hiding place of not-so-crypto-theists such as Behe and Dembski be? Only time will tell.


HARD TO BELIEVE WE'RE RELATED TO SUCH A NARROW-MINDED SPECIES.
NEWS
INTELLIGENT DESIGN BEING PUSHED BY RELIGIOUS GROUPS
UNCLE DARWIN

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The Legend of the Pied Piper

It is 1284, and the little German town of Hamelin is infested by a plague of rats. In desperation, the mayor advertises for someone to rid them of the rodents. Right on cue, in walks a stranger. A young man dressed in multicolored clothes offers to solve the town's pest problem. They agree on a price and he sets to work, but not in the way the townspeople expected.

> To blow the pipe his lips he wrinkled,
> And green and blue his sharp eyes twinkled,
> Like a candle flame where salt is sprinkled;
> And ere three shrill notes the pipe uttered,
> You heard as if an army muttered;
> And the muttering grew to a grumbling;
> And the grumbling grew to a mighty rumbling;
> And out of the houses the rats came tumbling.

That's how the English poet Robert Browning describes the piper at work in his celebrated 1849 poem *The Pied Piper of Hamelin.*

The piper sets off through the streets with the rats in tow and leads them into the River Weser, where they drown. Job well done, but the authorities refuse to pay up. The mysterious piper warns them that they will regret not honoring their promise, but they still refuse.

The next day, the piper returns to the town and again takes out his pipe to play a tune. But this time the result is very different—the town's children emerge and follow as obediently as the rats did. The piper leads them away to a nearby mountain.

Figure 1. The oldest depiction of the Pied Piper story, dating back to 1300, was a window in the church of Hamelin.

A portal opens wide, as if a cavern is suddenly hollowed, and the piper leads the children inside. When the last one is in, the door in the mountain shuts. Only one child remains behind, a lame boy too slow to keep up with the others. The boy is the only child left in the town; 130 disappeared, never to be seen again.

The Black Death

The Pied Piper is one of the most ancient and striking tales of German folklore. Made famous by the Grimm Brothers, it has been told and retold many times through the centuries by poets like Browning, philosophers like Wolfgang Goethe, and rock bands like Pink Floyd and Jethro Tull. Yet, for many, this is not simply a fairy tale but instead a true historical account. To this day, there exists an unwritten law that forbids singing or playing music on a certain street in Hamelin out of respect to the victims.

"I am positive that this was a real event," said Norbert Humburg, until recently the director of the Hamelin museum. "The town is filled with inscriptions that make reference to the facts of 1284."

The oldest depiction of the Pied Piper story, dating back to 1300, was a window in the church of Hamelin. The window was destroyed in 1600, but before then a traveler had painted a copy of the scene on the window (see figure 1). The watercolor shows a man dressed in many colors circled by children dressed in white.

Massimo Polidoro is an investigator of the paranormal, author, lecturer, and co-founder and head of CICAP, the Italian skeptics group. His Web site is www.massimopolidoro.com.

Figure 2. A painting from a traveller's journal dated 1592.

To this day, there exists an unwritten law that forbids singing or playing music on a certain street in Hamelin out of respect to the victims.

"A near perfect representation of the tale," said Humburg. "The window depicts a tragic event, while [the] date, month and year of it can be read in the many inscriptions carved on the houses and palaces of Hamelin." The experts, however, do not agree on what exactly took place.

"At its heart, the story tells us of the deaths first of all the rats in the town, then of all the children. One thing that could link all these elements together is the Black Death, which was brought to Europe by the fleas that lived on black rats. One of the signs that the Black Death was on its way would have been the rats emerging from their hidden places to come out into the streets and die. This is exactly what happens in the story," explained Humburg. The only problem with this is that the Black Death did not arrive in Europe until 1347, while the date reproduced all over town is 1284.

"I believe the date is a fiction. The story only emerges after the Black Death, but they deliberately give the events a date well before the appearance of the bubonic plague. Why? Because of a superstition that was around for the 100 years, when the Black Death was a threat in Germany. Say its name and you will invite it upon your town. So the story contains no mention of the plague and is deliberately set at a time before the plague had arrived. That's certainly how it started and then later generations never knew what the basis was and it takes on a life of its own," said Humburg.

Mass Murder

The idea is fascinating, but we still lack convincing proof for this theory, including the fact that both in the window and in the inscriptions, reference is made only to children. Rats are mentioned for the first time only in writings dated 1565 and later.

This is why some have suggested an even more sinister hypothesis: mass murder. In the very first text mentioning the legend, which dates back to 1384, an eyewitness report is cited. The original text has been lost, but a surviving transcription reads: "In the year of 1284, on John's and Paul's day was the 26th of June. By a piper, dressed in all kinds of colors, 130 children born in Hamelin were seduced and lost at the *calvarie* near the *koppen*."

The "koppen" could be a hill near a town called Coppenbrugge. Gernot Husam, who was director of the Coppenbrugge museum for many years, is convinced that something foul took place. He studied a painting from a traveler's journal dated 1592 that seemed to tell the familiar story of the piper's removal of the rats and the children from Hamelin. But to Husam, things are not what they seem.

"In the Middle Ages, pictures were full of symbolism, and for me this whole picture is a coded message," says Husam. "At the center—usually the part of a medieval picture where the most important images are placed—some stags are grazing under three trees. Now if you look at the family crest of the most important family of the time in Coppenbrugge, the von Spiegelbergs—a stag and a tree—you see the instant connection."

And what is this supposed to mean?

"It's all hidden in the symbolism. Also in the center is a stork—a symbol of good—eating a snake—a symbol of evil. The painting is basically being set up as a battle between good and evil. Here is the piper, dressed in what I believe is ritual pagan clothing, rather like Morris dancers in England. Now he's on the left—left was again always used to represent evil, so we understand he is a bad character. Over

on the right, the side of good, is a man fishing. He's a symbol for St. Peter, the fisher of souls. Up here the piper is luring the people up toward the mountain, the Coppenberg. But he's also shown leading what most people believe are the rats into the river, according to the story. I don't think they are rats. I think they are mice—mice were used to symbolize the soul, the souls of these people following the piper up the mountain. Their souls are being led astray and the fisher of souls can't save them—he's upstream from them—he'll never save them—they are lost for ever," said Husam.

In other words, for Husam, the Spiegelbergs (a family of religious fanatics), upon hearing of the pagan ritual that the piper was going to perform with the children in their land, decided to prevent such heresy by exterminating them all. That's quite a lot of "coding" in a very simple picture. It is another theory that leaves too much to the imagination and presents no solid proof.

Mass Migration

Many theories have been put forward throughout the centuries in order to explain what, if anything, could have taken place in Hamelin in 1284. Some imagine that since children were dancing while following the piper, the legend grew out of an epidemic of some disease producing abnormal body movements, like Huntington's disease. Others think that children—or better young men—died in some battle or, as philosopher Gottfried Leibniz thought, someone recruited them to participate in the 1212 Crusade, and they never returned.

The most plausible theory, however, based on more convincing historical facts, seems to be the one in which the young men of town were involved in the colonization of the new lands in the East.

In the second half of the 1200s, Bishop Bruno of Olmutz contributed to the creation of more than two hundred villages and towns in the area of Moravia, now on the east side of Germany, over which the Germans had just taken control.

"I have studied the place names around Hamelin and have discovered that they also crop up in two areas just north of Berlin in the east of Germany," says Jurgen

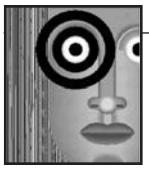
Figure 3. The ancient Rattenfangerhaus, the house of the rat-catcher.

Udolph, a professor of onamastics. "I have twelve clear cases of similar names in the two areas of Hamelin and East Germany. For example, near Hamelin is Hamelspringe and over in Uckermark is Hammelspring. It's like the settlers from Britain to America—they took the names of their home towns with them: 'New England,' 'New York,' 'Worcester'—the East Coast is full of examples."

Whatever the truth, the little town of Hamelin has learned to transform an ancient legend into its primary source of income. Wherever you look, you see traces of the piper: piper shops, rat malls, hotels, statues, fountains, amusement parks, museums. . . . The ancient Rattenfangerhaus, the house of the rat-catcher, is today a restaurant serving delicious "fried rat-tails" (actually veal cut in long strips to resemble tails). Every Sunday the town evokes the tale of the piper by having the children of Hamelin dress up as little rats. These stunts, as corny as they may sound, seem to work: there are now more than two million people from all over the world visiting Hamelin each year. Not bad for an old legend.

Acknowledgments

I would like to thank David Lee for providing much of the research needed for this article. □



The Science of Chemistry

Q: I have an inquiry about Internet dating and relationship Web sites. At least one claims in its advertising to use science to match up potential mates, but I'm skeptical. Is there any truth to that?

— R. Harwood

A: Online dating is a huge business with dozens of Web sites offering clients the chance to find love in cyberspace. Dating services, like many other businesses, like to adopt the veneer of scientific validity. While anyone can set up a Web-based dating profile-matching system, Web sites such as eHarmony.com and Chemistry.com claim to use science to help people find love, romance, or just a quick dip in the gene pool.

EHarmony is perhaps the best-known dating service claiming to mix science with seduction. According to the company's Web site, its marriage profile was "developed by a team of clinical experts . . . [and] is rooted in classical psychometric theory—which uses well-established standards to measure mental abilities and traits in a reliable way." It all sounds very scientific. I picture Kate Winslet in a slinky black dress under a white lab coat, mixing a beaker of crimson sex appeal and cool blue psychometric theory.

Yet there are serious questions about the validity of eHarmony's much-vaunted "scientific, twenty-nine-dimension" tests. Does their "science" greatly improve the quality or odds of a match? How good is their tests' construct validity? After all, many matches are made without a hint or claim of scientific basis for the pairing. Though the company and its founder, Neil Warren, insist that the tests are useful, they have yet to be scientifically validated. (EHarmony, incidentally, does not offer services for finding same-sex partners, because Warren, an evangelical Christian, does not believe homosexuality should be encouraged.)

Steven Carter, director of research at eHarmony, wrote an article in the February 2005 issue of the Association for Psychological Science's *Observer*. Carter had the opportunity to offer data and evidence that his work at eHarmony (and indeed the company's premise) has some validity, but instead wrote warmly about how helpful his work was to lonely singles and purred that "working at eHarmony has, in many ways, been a dream job."

While Carter offered little support for his claims, he did state that "to date, we estimate that over nine thousand eHarmony couples have married." This statistic, if true, clearly doesn't tell the whole story, as it cherry-picks the successes and omits the failures: how many of the eHarmony matches were incompatible? If, by one count, there are over five million eHarmony members looking for matches or marriage, nine thousand may not seem like a very impressive success ratio. Furthermore, the real question is how many of those nine thousand marriages lasted longer than average? For all we know, most of the eHarmony couples may have since divorced.

The APS *Observer* column, a de facto advertisement for eHarmony, was roundly criticized. One respondent, Maureen Olmsted of Arizona State University, noted in a letter to the editor about the article that, "A search of PsychInfo found no papers published by Neil Clark Warren on the topic of relationships. . . . If Warren has thirty-five years of experience studying marriage, why hasn't he published it?"

EHarmony has many hallmarks of pseudoscience, including a reluctance to subject their claims and data to peer review. Until they can back up their claims, single skeptical and science-minded folk may want to check out Science Connection (www.SciConnect.com) to help them identify potential partners; the dating service has been around since 1995 and has led to more than a few consummated couplings. According to the Web site, "The world is a crowded Petri dish, and yet for those of an intellectual bent who happen to be single, it's not easy, especially past university age, to find *that certain microbe* for a great symbiotic relationship."

Benjamin Radford is a writer and investigator with the Committee for Skeptical Inquiry. His Web site is at www.RadfordBooks.com.

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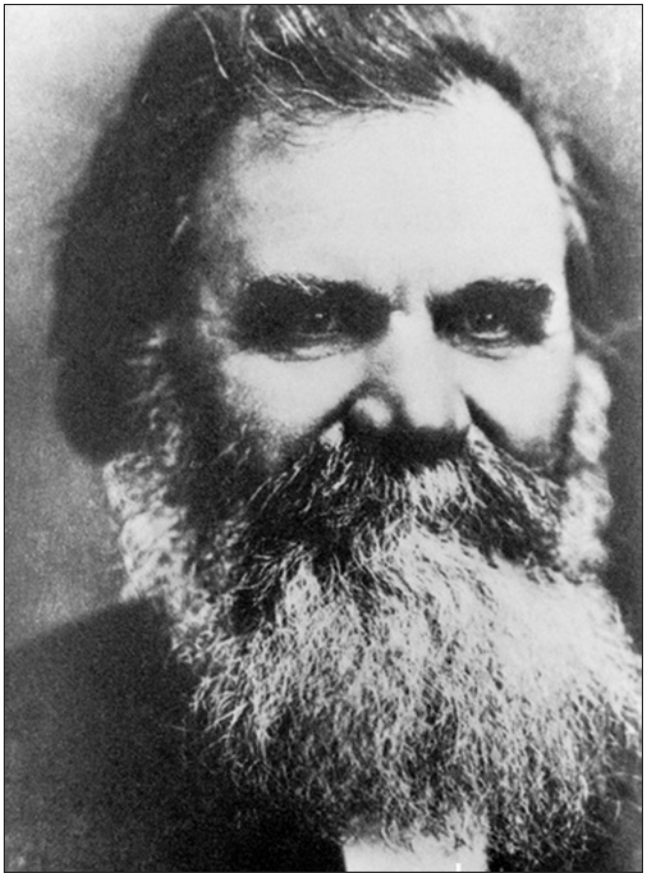
Chiropractic

A Profession Seeking Identity

The chiropractic profession is resisting changes that will establish it as a back-pain specialty while seeking an identity that will continue to allow chiropractors to treat a broad scope of health problems.

SAMUEL HOMOLA

In 1895, D.D. Palmer, a grocer and magnetic healer, announced that "Ninety-five percent of all diseases are caused by displaced vertebrae, the remainder by luxations of other joints" (Homola 1963). Palmer claimed that he had cured deafness and heart trouble by adjusting the spine (Wardwell 1992). He concluded that most diseases could be cured by adjusting vertebrae to remove interference with "nerve vibrations" that flowed from the brain to the spinal cord and out through openings between the vertebrae (Palmer 1914). Palmer's questionable and anecdotal claims gave birth to the profession of chiropractic.



D.D. Palmer

There are no appropriately controlled studies . . . to indicate that any type of dysfunction in structures of the spinal column is a cause of organic disease.

Today, the chiropractic profession agonizes over the definition of chiropractic, which has changed little except in wording used to explain how adjusting the spine can [redacted]

Samuel Homola is a retired chiropractor. He is the author of fifteen books, including Inside Chiropractic *(Prometheus, 1999) and* A Chiropractor's Self-Help Back and Body Book *(Hunter House, 2002). This is his third article for* Skeptical Inquirer.

subluxation theory was explained in a very simple way: a vertebra out of its normal position encroached upon spinal nerves, interfering with the flow of nerve impulses to the tissues and organs supplied by the affected nerve. Certain spinal nerves supplied certain organs. Adjustment of a selected vertebra would release vital nerve flow so that so-called "innate intelligence" could heal the body (Wardwell 1992). This theory has since been rejected and ridiculed by the scientific community.

New Definition for an Old Approach

Facing the realization that pressure on a spinal nerve cannot be demonstrated to be a cause of organic disease and that slight displacement of a vertebra does not compress a spinal nerve, defenders of the subluxation theory further theorized that abnormal joint function could affect general health by triggering nerve impulses from proprioceptors, nociceptors, mechanoreceptors, and other monitors of joint function. There are no appropriately controlled studies, however, to indicate that any type of dysfunction in structures of the spinal column is a cause of organic disease (Nansel 1995).

It is the consensus of the chiropractic profession's schools and leaders that chiropractic should not be limited to treatment of back pain and should focus on treatment of general health problems. In July 1996, the Association of Chiropractic Colleges (ACC), representing sixteen North American chiropractic colleges, drafted a new paradigm stating that "Chiropractic is concerned with the preservation and restoration of health, and focuses particular attention on the subluxation. A subluxation is a complex of functional and/or pathological articular changes that compromise neural integrity and may influence organ system function and general health" (Association 1996). Such a subluxation has never been proven to exist.

In 1997, the Foundation for Chiropractic Education and Research (FCER), supporting the vague, untestable, and all-inclusive ACC paradigm, published a monograph titled *The Role of Subluxation in Chiropractic.* Noting that a vertebral subluxation complex (VSC) "may not be detectable by any of the current technological methods," the monograph explained, "[The VSC] embraces the holistic nature of the human body, including health, well-being, and the doctor/patient relationship as well as the changes in nerve, muscle, connective, and vascular tissues which are understood to accompany the kinesiologic aberrations of spinal articulations" (Rosner 1997).

The ACC paradigm was endorsed by the International Chiropractic Association and the American Chiropractic Association in November 2000 and by the World Federation of Chiropractic in May 2001.

A random survey of 1,102 active North American chiropractors in 2003 revealed that 88.1 percent of 687 respondents believed that the term "vertebral subluxation complex" should be retained by the chiropractic profession. The respon-

dents also believed that vertebral subluxation is a significant contributing factor in 62.1 percent of visceral ailments. The majority believed that spinal adjustment should not be limited to treatment of musculoskeletal problems (McDonald 2003).

Chiropractic Consensus versus Scientific Consensus

Scientific consensus does not support the theory that vertebral misalignment or "subluxation" is a cause of organic disease (College 1996, Crelin 1973, Jarvis 2001, National Council Against Health Fraud 2005). Spinal nerves primarily supply musculoskeletal structures. Organ function is governed by the autonomic nervous system in concert with psychic, chemical, hormonal, and circulatory factors. Autonomic cranial and sacral nerves that supply the body's organs do not pass through movable joints. Spinal nerves are commonly irritated or compressed by bony spurs, herniated discs, and other abnormalities in the spine. Even the most severe compression of a spinal nerve, however, which cripples the supplied musculoskeletal structures, does not cause organic disease. It is unreasonable to assume that slight misalignment of a vertebra or an undetectable vertebral subluxation complex can cause disease or ill health when those effects do not occur because of gross displacement of a vertebra or as a result of impingement of a spinal nerve.

There is considerable evidence that spinal manipulation can be helpful in treating some types of back pain (Bigos 1994, Shekelle 1991), but "there appears to be little evidence to support the value of spinal manipulation for nonmusculoskeletal conditions" (Shekelle 1998).

Choices for the Future

Back pain is one of this nation's most common medical problems, accounting for $50–100 billion in health costs annually (Pelletier 2002). Despite the need for a back-pain specialty that combines the use of spinal manipulation with physical therapy modalities, it does not appear that the chiropractic profession plans to take advantage of the growing back-pain market by specializing.

Spinal manipulation is only one treatment of many available in the treatment of back pain. A back-pain specialty would require the use of a variety of physical treatment methods in concert with various medical specialties. Chiropractors who adjust subluxations to restore and maintain health do not qualify as back specialists. Chiropractic as an alternative method of primary care for general health problems is far from being accepted by the scientific community.

A 2005 report by the Institute for Alternative Futures reported that the future of chiropractic is uncertain because of economic challenges and the limitations in chiropractic science and methods. The Institute predicted four possible scenarios for chiropractic: (1) slow, steady growth as support mounts for the use of manipulation in the treatment of back and neck pain; (2) a downward spiral from competition and healthcare costs; (3) evidence-based collaboration in the care of neuromusculoskeletal conditions; or (4) chiropractors will become healthy life doctors "specializing in preventing disease with health-management plans" (Institute 2005).

Chiropractor working on a patient [Photo via Newscom].

Scientific consensus does not support the theory that vertebral misalignment or "subluxation" is a cause of organic disease.

Concerned that the chiropractic profession "has failed to define itself in a way that is understandable, credible and scientifically coherent," a group of evidence-based chiropractors offered a model for "spine care" that focuses primarily on treatment for back pain. The purpose of the plan is to "help integrate chiropractic care into the mainstream delivery system while still retaining self-identity for the profession" (Nelson 2005). The plan was not well-received by the chiropractic profession at large, which is loathe to restrict chiropractic treatment to back pain, preferring instead to claim a broad scope of health problems as its purview.

On June 15, 2005, the World Federation of Chiropractic, at its Eighth Biennial Congress, unanimously agreed that chi-

ropractors should be identified as "spinal health care experts in the health care system . . . with emphasis on the relationship between the spine and the nervous system" (World 2005). This definition fails to place proper limitations upon chiropractors who use spinal adjustments to treat general health problems, plunging the profession deeper into pseudoscience and away from establishing an identity for chiropractors as back-pain specialists. Most states continue to define chiropractic as a method of adjusting vertebral subluxations to restore and maintain health, allowing chiropractic treatment of almost any ailment.

It is unreasonable to assume that slight misalignment of a vertebra or an undetectable vertebral subluxation complex can cause disease or ill health when those effects do not occur because of gross displacement of a vertebra or as a result of impingement of a spinal nerve.

Filling a Niche in Mainstream Health Care

If the chiropractic profession continues to define itself as a method of health care based on the relationship between the spine and the nervous system rather than as a method of treating back pain, it seems likely that physical therapists and other practitioners of physical medicine will step in and offer manipulation along with physical therapy modalities in the treatment of back pain. According to the American Physical Therapy Association, "Physical therapy, by 2020, will be provided by physical therapists who are doctors of physical therapy and who may be board-certified specialists. Consumers will have direct access to physical therapists in all environments for patient/client management, prevention, and wellness services. Physical therapists will hold all privileges of autonomous practice" (American 2005).

Many physical therapists are already using manipulation/mobilization techniques. Of the 209 physical therapy programs in the United States, 111 now offer Doctor of Physical Therapy (DPT) degrees. About thirty-five states now grant physical therapists direct access to patients (Institute 2005), and there are nearly three times as many physical therapists (137,000) as chiropractors (49,000) (Bureau 2005).

Given a choice, it seems likely that informed consumers who seek treatment for back pain would prefer the services of a physical therapist whose therapeutic armamentarium is limited to treatment of musculoskeletal problems rather than the controversial services of a chiropractor who adjusts the spine to restore and maintain health. In 2002, only about 7.4 percent of the population was seeing a chiropractor annually (Tindle 2005). I suspect that this percentage would increase if the chiropractic profession identified itself as a specialty that deals with back pain and related problems.

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A Skeptical Consumer's Look at Chiropractic Claims: Flimflam in Florida?

There is no scientifically credible evidence that chiropractic treatment can alleviate high blood pressure or arthritis, yet when an author called the offices of local chiropractors asking if they could help him with these conditions, three-fourths of the offices asserted that they could.

BRUCE THYER and GARY WHITTENBERGER

The late Carl Sagan said "Extraordinary claims require extraordinary evidence." This skeptical principle can be applied generally to the area of consumer affairs and more specifically to the claims of chiropractic, an "alternative healing" approach now practiced widely throughout the United States and other parts of the world.

Chiropractic practice began in 1895, when D.D. Palmer administered a "chiropractic adjustment" to a deaf man who reportedly regained his hearing. Palmer, a grocer and "magnetic healer," made great claims about the importance of his new treatment for human ailments. According to Palmer, "A subluxated vertebrae . . . is the cause of 95 percent of all diseases . . .

the other 5 percent is caused by displaced joints other than those of the vertebral column."

The very existence of vertebral subluxations and their etiological role in health problems is uncertain and subject to considerable controversy, since there is very little empirical evidence in support of the efficacy of chiropractic (see Crelin 1973; Keating, Charlton, Grod, Perle, Sikorski, and Winterstein 2005).

J.J. Palmer, the son of chiropractic's founder, was primarily responsible for the development of chiropractic as a profession within the United States. In a little more than a hundred years, chiropractic has advanced dramatically to the point where there are now sixteen accredited colleges of chiropractic and fifty thousand licensed chiropractors in the U.S. alone.

Within the state of Florida, where the current study was initiated, chiropractic medicine is defined by law as "a noncombative principle and practice consisting of the science of the adjustment, manipulation, and treatment of the human body in which vertebral subluxations and other malpositioned articulations and structures that are interfering with the normal generation, transmission, and expression of nerve impulses between the brain, organs, and tissue cells of the body, thereby causing disease, are adjusted, manipulated, or treated, thus restoring the normal flow of nerve impulse which produces normal function and consequent health . . ." (Florida Statute 460.403). In 1998, Florida, with its four thousand practitioners, ranked fourth in the nation in the number of licensed chiropractors.

It is generally agreed that chiropractic may be a useful approach in alleviating pain for a very limited set of disorders associated with the back or spine. However, many skeptics are concerned that chiropractic is being applied to disorders for which it is an inappropriate intervention and for which solid evidence of its efficacy is lacking. If this is the case, then several unfortunate consequences might result. Patients might be harmed by the treatment itself, they might waste their time and money, or they might be deterred from seeking effective treatments. Skeptics fear that chiropractors and their representatives may often promise too much and create expectations that chiropractic can cure or heal medical problems for which it is ill suited.

This study was designed to ascertain the degree to which the representatives of chiropractic in a medium-sized Florida city would agree to treat a patient presenting complaints for which chiropractic has not been shown to be effective (see Goertz, Grimm, Svendsen, and Grandits 2002; Plaugher et al. 2002; Ernst and Canter 2006). The setting for this study was Tallahassee, the capital of Florida, with a population of approximately 151,000 people and where both the authors of this article reside. The local telephone book lists about thirty-three chiropractors in the city. Bruce Thyer contacted the offices of most of these practitioners by telephone during the months of December 2005 and January 2006 and was successful in reaching someone in the office in twenty-eight of the cases. Thyer used a standard opening script for each call: "Good afternoon, my name is Bruce and I am fifty-two. I am interested in learning if chiropractic can help me with high blood pressure and arthritis." Occasionally, after an initial response, Thyer would ask for confirmation by saying "So you treat people with high blood pressure and arthritis?" In nearly every case, the call was received by a secretary, receptionist, technician, or someone representing the chiropractor, not by the chiropractor himself. So, how often did the representatives of chiropractors agree to treat a fifty-two-year-old man with high blood pressure and arthritis?

Bruce Thyer and Gary Whittenberger are well-adjusted members of the Center for Inquiry/Tallahassee Community.

Twenty-one of the twenty-eight offices (75 percent) said that they could treat high blood pressure, arthritis, or both; two of the twenty-eight (7 percent) said they did not treat either of the disorders; and three of the twenty-eight (11 percent) indicated that they didn't know or were uncertain if these problems could be treated. Among the positive responses were the following:

> "Absolutely, all the time."
> "Yes, definitely."
> "Yes, it should help."
> "Yes it can."
> "It has been known to be of great benefit for both."
> "I know it will help with the high blood pressure, and with the arthritis it will help maintain you, but it will not cure you."
> "Not high blood pressure, but arthritis, yes."
> "Yeah, sometimes, especially the high blood pressure part."
> "The arthritis . . . and generally, yes, blood pressure. He can help you in terms of making you feel better."
> "Sure, I can administer the adjustments, open up the joints and improve blood flow."
> "Can probably help with the pain of arthritis, but blood pressure, no that would need to get homeopathy treatment and he does that too."
> "Yes, the doctor can treat that [high blood pressure and arthritis]. What insurance do you have?"

Negative responses included:

> "Generally that is not what chiropractic does."
> "Primarily [we] focus on spinal and orthopedic problems, not arthritis or high blood pressure."

Uncertain responses included:

> "This is something we would need to talk to the doctor about, and he is out of town."

In the end, three-quarters of the representatives of chiropractors in Tallahassee agreed that their offices would be able to treat someone with high blood pressure and/or arthritis. Now, it might be argued that the chiropractors themselves would have given responses much different from those obtained in this study. Maybe they would not have been as agreeable to the treatment of high blood pressure and arthritis as their employees were. At worst,

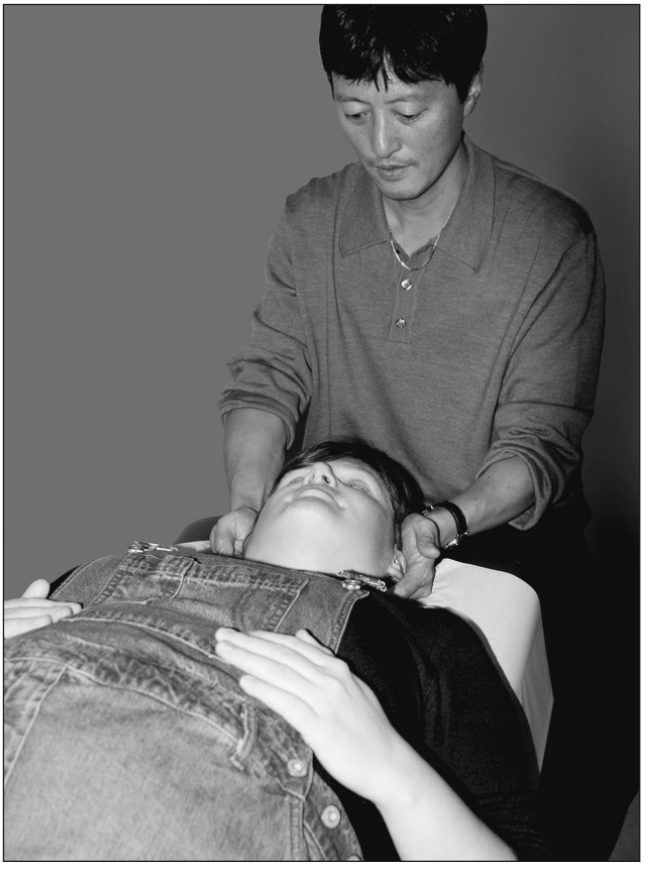
the office employees were accurately representing the intentions of the chiropractors for which they work, and those chiropractors were offering treatment for high blood pressure and arthritis. At best, the employees were misrepresenting the intentions of the chiropractors for which they work and were promising too much, in which case the employees were not properly trained to interact with prospective patients. Neither outcome is in the best interest of the public.

Results similar to those of this study have been reported elsewhere. Recently, a reporter in Ontario, Canada, posed as a mother seeking treatment for her two-year-old son's chronic ear infections. She called the offices of fifty randomly selected chiropractors and asked if the chiropractors provided treatment for young children and if they would be able to help with a child's ear infections. Forty-five of the fifty offices (80 percent) said they treated young children and thirty-six of the fifty (72 percent) said they could help with the ear infections. These expectations were given even though the glosso-pharyngeal nerve in the ear doesn't go through the spine, which is the intended target of chiropractic.

In the 1970s, physician Stephen Barrett supervised a woman who took her healthy four-year-old daughter to five chiropractors for a "checkup." Prior to these visits, the child was examined by a pediatrician and found to be healthy. The mother carried a concealed tape recorder during the visits. One chiropractor ran a "nervoscope" up and down the child's spine for a minute and said she had pinched nerves to the stomach and gallbladder, and he recommended X-rays. The second chiropractor said the child's pelvis was twisted and needed adjusting. The third found one hip to be elevated, and recommended adjustments. The fourth found a shorter leg and neck tension, and recommended weekly adjustments. And the fifth found hip and neck misalignments and without permission provided adjustments to the four-year-old. The screams of the child during the adjustments, heard over the tape recorder, caused Dr. Barrett to terminate this study. Later, as an eleven-year-old, the girl was in good health and a gymnast (for more information, see www.chirobase.org).

There is evidence from this study and other similar investigations that chiropractors or their representatives are agreeing to treat, and possibly attempting to treat, disorders for which their practice is not appropriate. In a sense, they are advertising that they can effectively treat certain disorders when there are few or no controlled clinical studies that actually back up these claims. Thus, many of the claims of chiropractic can be considered extraordinary, and as Sagan would remind us, these claims require extraordinary evidence before they should be believed.

We also suggest that the approach used in this study, calling up health care providers and asking them about the types of disorders they claim to treat, is a very useful and low-cost investigative strategy that can be adopted by skeptical consumers in their local communities. Our study revealed that the large majority of chiropractic offices contacted claimed to be able to treat hypertension and arthritis, claims that the current scientific literature does not justify. The costs to consumers who are seeking legitimate and effective treatments for these serious health problems, and who instead receive inappropriate and ineffective diagnostic (e.g., spinal radiographs) and therapeutic procedures (spinal manipulation), are undoubtedly substantial. So, too, are the costs to private, state, and federal health insurance providers. The extent to which consumers are diverted from receiving evidence-based treatments for serious health problems is similarly unknown but also likely to be considerable.



Chiropractic adjustment.

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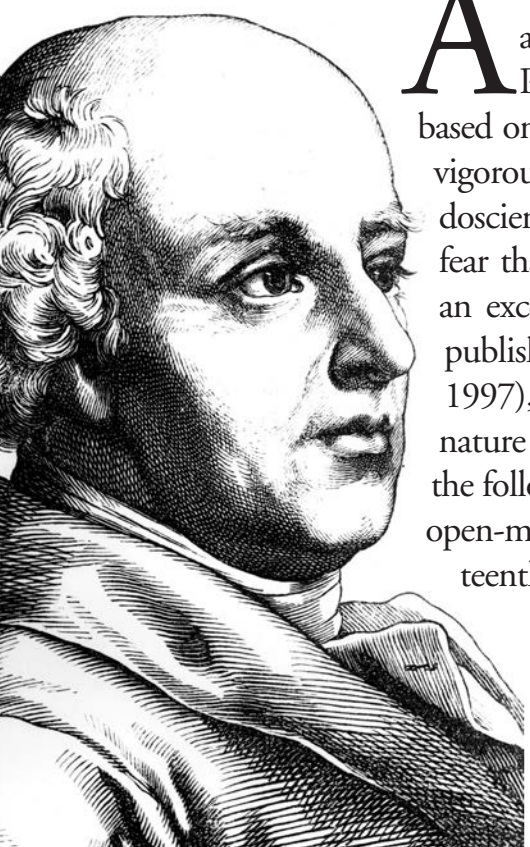
The Difference between Hahnemann and Darwin

In contrast to evolutionary biology, homeopathy is a closed, dogmatic system of fixed rules. Moreover, its basic tenet is an irrational tautology that lacks any factual basis.

U. KUTSCHERA



A "Special Report" published recently in *Nature* argued that Samuel Hahnemann's famous Principle of Similars ("let like cure like"), which is based on the treatment of the sick with extremely diluted, vigorously shaken agents (so-called "potencies"), is a pseudoscience (Giles 2007). While that conclusion is true, I fear that this paper, which can be viewed as a sequel to an excellent review article on homeopathy and physics published ten years ago in the SKEPTICAL INQUIRER (Park 1997), will not convince all readers of the antiscientific nature of this alternative medicine. However, I think that the following additional arguments should persuade every open-minded person that homeopathy is, in fact, eighteenth-century quackery.

First, the claim of homeopaths that the extremely diluted remedy has an effect independent of the belief of the patient and practitioner has been refuted. This contention is based on the premise that the various potencies can be distinguished from one another. In a quantitative study, it was shown that two specific potencies, namely Natrium muriaticum 30C and Sulphur 30C, which are said to be very active and have strikingly different properties, were indistinguishable by an eminent homeopath. For identification of the potencies the practitioner was allowed to use all available methods, whether clinical, physical, or chemical (Roberts 1989).

Second, homeopaths usually argue that Hahnemann's principle has been corroborated by the treatment of animals with homeopathic medicine. In these trials, the nonhuman patient is not even aware of receiving any medicine, so the placebo effect can be discounted. But a recent article on homeopathy in veterinary medicine showed that this popular claim is false (Taylor 2005).

Third, modern homeopathy rests on the assumption that remedies retain physiological activity even when diluted beyond Avogadro's number (see figure 1), meaning no molecules of the active substance should remain ("high potencies," i.e., are "solutions without solute"). This "memory-of-water" or "imprint" hypothesis, which was discussed in detail by Park (1997), has recently been refuted. Using novel spectroscopic techniques, it was shown that water loses its "memory" of structural correlations within fifty femtoseconds (a femtosecond is 10^{-15} of a second), discounting any long-term "information storage" of former dissolved particles, as claimed by homeopaths (Cowan et al. 2005).

Finally, it should be noted that the tenets of homeopathy have not changed much over the past two hundred years. If Hahnemann had to pass an examination in homeopathic medicine today, he should have no problems answering most questions correctly. However, Charles Darwin would have no chance at passing an examination in evolutionary biology today, because our modern synthetic theory of biological evolution has developed far beyond his classical Principle of Descent with Modification by Natural Selection. Terms such as genotype, phenotype, germ-line mutations, etc., were unknown to Darwin, who used the methods of his time. Despite these restrictions, he raised many new, open questions and finally became the doyen of a new research agenda and scientific discipline (Kutschera and Niklas 2004).

In contrast to evolutionary biology, homeopathy is a closed, dogmatic system of fixed rules. Moreover, the basic tenet of homeopathy, "Nothing, dissolved in water, is more effective than water in which nothing is dissolved," is an irrational tautology that lacks any factual basis (see figure 2). Homeopathy must be regarded as a static, quasi-religious faith that has no place in any science curriculum.

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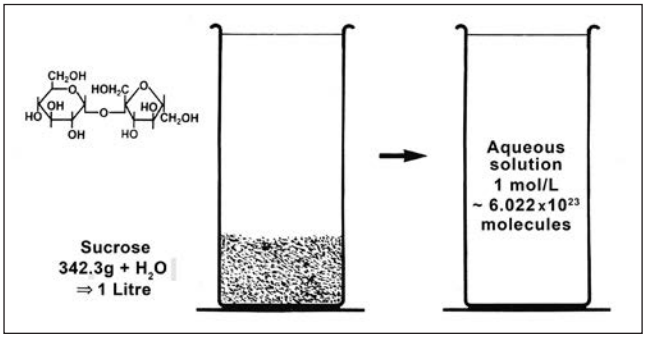

Figure 1. Illustration of Avogadro's number (N_A). A defined amount of sucrose (342.3g) is dissolved in pure water to give a volume of 1 Liter. This aqueous solution contains about 6.022 x 10^{23} molecules of sucrose (N_A).

The Avogadro number (or constant) is the number of "entities" (atoms or molecules) in one mole (N_A=6.022 3 10^{23} 3 mol^{-1}). If a stock solution of 1 mol 3 L^{-1} of substance (for instance, sucrose) is diluted 24 times by a factor 1/10, no solutes remain in this "diluted solution" (i.e., "D 24" is pure water).

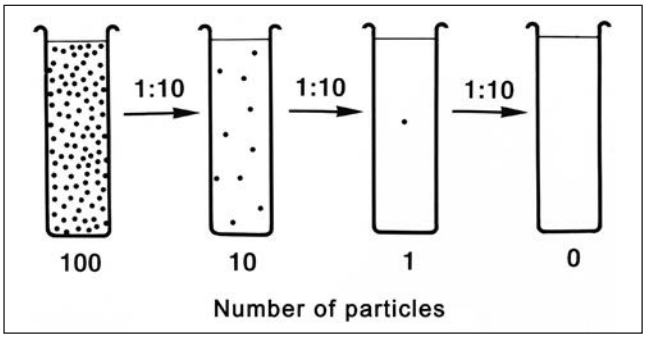

Figure 2. Dilution series. A concentrated solution is serially diluted by a factor of 10. After three steps, the number of particles per volume of water drops from 100 to zero (average value). According to one of the dogmas of classical homeopathy, this "solution without solutes" is supposed to exert a positive physiological effect on the bodies of animals, humans, and plants.

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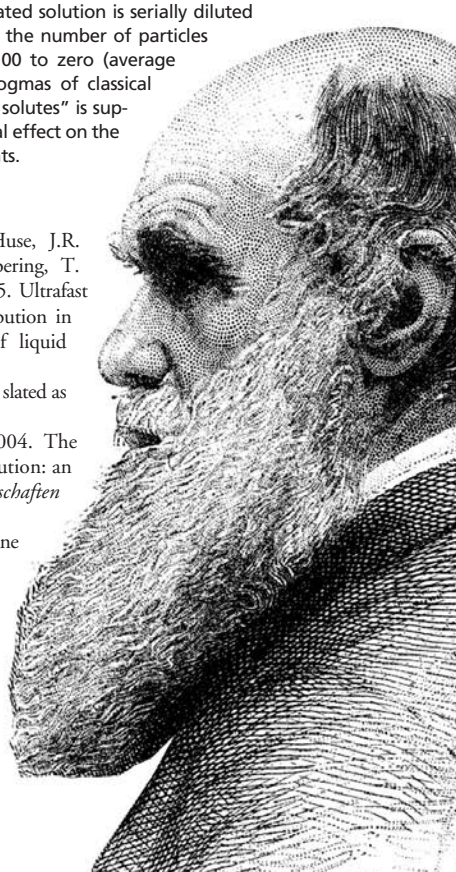

Whatever Happened to 'Jane Doe'?

In ruling on a lawsuit prompted by a noted recovered memory case, the California Supreme Court has decided overwhelmingly in favor of social scientists Elizabeth Loftus and Melvin J. Guyer and this magazine. It is an important victory for open, skeptical inquiry and free speech.

CAROL TAVRIS

Five years ago in this magazine, Elizabeth Loftus and Melvin J. Guyer published a two-part article called "Who Abused Jane Doe?" (Loftus and Guyer 2002a, 2002b). It was their critical interpretation of a case study that provided alleged evidence of a repressed and then recovered memory of childhood sexual abuse, and its subject, "Jane Doe," was not happy with their account. In February, 2003, she sued both of them, this magazine, its publisher, me, and a few others involved in the investigation for defamation, invasion of privacy, infliction of emotional distress, and fraud. She claimed twenty-one counts and causes of action within these four categories, and she wanted more than a million dollars in punitive damages and compensation for her

injured feelings. The invasion of privacy claim was especially ironic, given that Loftus and Guyer never once revealed her name, and the SKEPTICAL INQUIRER and I didn't even know what it was until she filed the lawsuit in her own name. And so, it was Jane Doe herself who told the world that her real name was Nicole Taus.

After wending its way for years through the California courts, ending with a ruling in early 2007 by the California Supreme Court, the case was finally resolved. Taus lost resoundingly on twenty of the twenty-one counts. The SKEPTICAL INQUIRER's right to publish the articles was completely supported; Loftus, Guyer's, and my right to write and talk about the case was given complete protection; and the Supreme Court ruled that because the defendants won the "overwhelming majority" of Taus's claims, we were entitled to recover fees and costs. Taus thus faced a bill for $450,578.50—the cost of nearly five years of litigation and fees for the attorneys representing all the defendants she had accused. All in all, it was a sound defeat for the plaintiff and a tremendous victory for open, skeptical inquiry and free speech—with one quirk related to that lone twenty-first count. Here is the full story.

First, some background. In 1997, psychiatrist David Corwin and his colleague Erna Olafson published a case history that proponents of recovered-memory therapy quickly began using—in conversation, in scholarly writing, and in court—as proof of the existence of repressed memories. Corwin had entered Taus's life (at that time, noted as "Jane Doe") during a custody evaluation in the early 1980s, when child sex-abuse allegations were reaching a peak, and videotaped six-year-old Taus as she claimed that her mother physically and sexually abused her. Corwin believed her, and the mother lost custody and even visitation rights. Taus lived with her father until he became seriously ill, at which time she went to live with a foster mother. When she was seventeen, Corwin returned to interview and videotape her once again. During this encounter, she at first didn't recall any acts of sexual abuse but eventually did. Corwin's detailed account, and his repeated showing of her videotapes as a child and teenager at conferences, were persuasive to many mental health professionals, researchers, and of course prosecutors.

Yet Loftus and Guyer were suspicious of Corwin's story. Using public records and newspaper clippings, they eventually located Taus's family. After poring over thousands of pages of court records documenting the virulence of the original custody battle, including a thorough, court-ordered report by a clinical psychologist who doubted that Taus had been sexually abused (a report not mentioned by Corwin), and after interviewing several key players in the story, they became convinced that Taus's biological mother was almost certainly innocent. When the mother learned that someone believed her after so many years, she sobbed and said, "I never thought this day would come." It had been more than a decade since she had lost custody of her daughter.

As Loftus and Guyer were getting ready to publish their findings and interpretation of the evidence, however, Nicole Taus complained to the University of Washington, where Loftus was a professor, that her privacy was being violated by a faculty member who was investigating her story. Despite having already permitted her face to be shown and the details of her life to be publicly revealed, she pursued her complaint. University officials seized Loftus's files, and although university regulations stipulate that all such complaints against faculty members are to be resolved within 120 days, the investigation against Loftus went on for nearly two years, during which time she was forbidden to speak or write about the case. Eventually Loftus was completely cleared of wrongdoing or ethical violations. At the University of Michigan, Mel Guyer was enduring similar harassment from his Internal Review Board, but finally he, too, was free to publish.

And so their two-part article "Who Abused Jane Doe?" appeared in the SKEPTICAL INQUIRER, along with a companion piece that I wrote describing the struggles that Loftus and Guyer had endured at their respective universities (Tavris 2002). "Who Abused Jane Doe?" offered an alternative explanation to the one proposed by the repression proponents: namely, that the child had probably not been abused at all, but that her "memories" were the result of suggestive influences on the part of her father, her stepmother, and perhaps a few mental health professionals as part of her father's determination to gain custody of his daughter.

When Nicole Taus filed her lawsuit, the lawyers representing all the defendants hoped to get the case dismissed immediately on the grounds that Loftus and Guyer had not done anything that ordinary investigative journalists would not do. The lawyers argued that Taus's suit was a Strategic Lawsuit Against Public Participation (SLAPP), filed in retaliation for the defendants' protected exercise of free speech.[1] Our anti-SLAPP motion alleged that the plaintiff's suit was intended to interfere with certain constitutional rights of the defendants and the public's interest in being informed of important issues and questions of public policy and controversial topics. Once we made our motion showing that fundamental constitutional rights were placed at risk by Taus's suit, Taus was required to show that she had a chance of prevailing on any of her claims if they were to proceed to trial. As the case made its way through the courts, the plaintiff was found to have filed a suit that indeed infringed on our constitutional rights, that her claims lacked any likelihood of prevailing if the case went to trial, and that all of her charges were without legal foundation (*Taus v. Loftus et al.* 2007). The California Supreme Court dismissed all counts against the defendants but split on one single factual question involving Loftus only.

To understand this one issue, you need to know that the Court doesn't rule on the *validity* of a person's claim but rather its *legality*. If you sue someone for calling you "a son of a bitch," the Court doesn't determine whether the person *actually* called you a son of a bitch but whether you have a legal

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claim against him if it turns out to be true that he said those words. In this case, Taus's former foster mother, who had given Loftus information about Taus's background, attempts to reach her biological mother, and other matters, alleged that she had given Loftus this information under false pretenses. (Guyer was not involved in that interview.) The foster mother claimed that Loftus had told her she was Corwin's supervisor, thereby gaining information that she, the foster mother, would otherwise not have revealed. In issuing its ruling, the Supreme Court *had to assume this allegation was true before it could determine whether there was any legal basis for remanding the matter to trial, where a jury would decide whom to believe.* For example, the courts have ruled that certain categories of investigators—police officers and reporters among them—*are* allowed to lie to interviewees in order to gain information. Are social scientists? Realtors? Marketers? Employers?

By a narrow majority, the Supreme Court held that one narrow, particular kind of lie can be actionable: the kind the foster mother alleged. Investigators may not pretend to have a special relationship with the target of their investigation (e.g., Corwin) in order to lower their interviewee's (e.g., the foster mother's) normal caution about disclosing personal matters. They may not intrude on a privileged relationship in which the subject has an expectation of privacy. Taus, said the Court, had a reasonable expectation that no one would pretend to be privy to her special relationship with Corwin—that she could trust Corwin's supervisor (as if he had one!) as much as Corwin. Although Taus's own lawyer explicitly informed the Court that Corwin never acted as Taus's therapist, the Court nonetheless decided that because Corwin is a psychiatrist, he and Taus had some kind of trusting, therapist-patient-like relationship. And so they ruled that the case could go to trial to determine that one factual issue: Did Loftus lie to the foster mother to get information about Taus? But, as one of the dissenting judges wrote, "In fact, it is fairly apparent that the impetus for this litigation is not Loftus's investigative techniques but her perceived adversarial stance toward Corwin and, derivatively, toward Taus. But by any ordinary sense, the desire to deny an investigator information based on the investigator's viewpoint cannot be called an expectation of privacy or seclusion, and the enforcement of Taus's preference through tort law is contrary to free academic inquiry and the First Amendment."

Some of Loftus's opponents have misinterpreted the Court's ruling for their own purposes as a confirmation that Loftus lied to the foster mother. In fact, Loftus is adamant that she did no such thing. The foster mother also claimed that during the interview, when she somehow discovered that Loftus was not whom she said she was (how would this have happened if Loftus was deceiving her?), the interview turned hostile and she demanded that the tape recorder be turned off and the tape handed over. Loftus refused, she said, and so she ended the interview at once. However, as witnesses to the interview can confirm, the interview was not taped; it lasted four hours until Loftus ended it, and when it was over, the foster mother amiably posed for photographs with Loftus, who had put her arm supportively around her. What seems likely, therefore, is that the foster mother repented of her conversation with Loftus in order to make amends with Taus. The phenomenon of "source remorse" is well known to journalists and biographers.

Nonetheless, there it was: Taus facing hundreds of thousands of dollars in costs, Loftus facing a petty, but onerous, she-said/she-said trial.[2] And then Taus made an offer to settle. She would drop the remaining claim against Loftus for $7,500—a pittance compared to the million she had been asking—plus an agreement by Loftus to forgo her portion of the attorneys' fees she was otherwise entitled to receive from Taus. Accepting the offer, Loftus knew, meant that her enemies would say she was admitting that she used deceit to interview the foster mother. But accepting the offer also meant she would avoid years of potentially protracted and costly legal machinations. The foster mother, presumably wishing to remain in Taus's good graces, might lie about how Loftus represented herself to her. Most of all, the defendants had won their biggest battle—to protect their right, and the right of journals such as the SKEPTICAL INQUIRER, to investigate case studies and publish alternate interpretations of them. So Loftus accepted the offer, and the case ended for her.

We other defendants, all of whom had been fully exonerated on all counts, pursued our right to recover legal fees and costs. Taus's lawyer filed yet another motion, this time to decrease the amount of money that Taus was liable for, based on a subtraction of fees waived by the Loftus settlement. On October 2, 2007, a judge agreed to reduce the fees to those incurred on behalf of the remaining defendants, and as of this writing we await his decision as to the exact amount Taus will have to pay. (If it is too high, her attorney may appeal it.)

Who abused Jane Doe—and whom did she abuse? She wanted her story told her way, as everyone does; and when others disputed her version of events, she took out her anger the American way: by suing. Fortunately, this time, the result was an undeniable victory for free speech and scientific inquiry.

Notes

1. In the early l990s, the California Legislature enacted into the Code of Civil Procedure the anti-SLAPP law, noting a disturbing increase in lawsuits brought primarily to chill the valid exercise of the constitutional rights of freedom of speech. It recognized the public's interest in encouraging participation in the significant matters of a society and was essentially a way to ensure that such participation was not suppressed through the misuse of the judicial process.

2. Technically, one other defendant remains in the case; Taus also sued Harvey Shapiro, a private investigator who obtained court records and arranged for the interview with the foster mother. As of this writing, Taus's claim against him has not been fully resolved. To our knowledge, he did nothing outside the scope of the work of ordinary private investigators.

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How to 'Haunt' a House

When a terrified family sought information about the ghosts they believed haunted their home, they found only mystery-mongering misinformation that confirmed their fears. A careful, skeptical investigation found fascinating answers and helped the family.

BENJAMIN RADFORD

On Tuesday, November 11, 2003, I received a call at the Center for Inquiry in Amherst, New York, from a local woman asking for help. She believed her house was haunted by ghosts or evil spirits and didn't know where else to turn. In any other business office, this might have been seen as a prank, but at the Committee for the Scientific Investigation of Claims of the Paranormal (now the Committee for Skeptical Inquiry), we take these things seriously.

The case would turn out to be a fascinating one with many of the classic haunting phenomena, including "cold spots," poltergeist activity, animals acting strangely, and spooky footsteps and voices. There were even reports of a demonic face and a ghost attack! It sounded like just my kind of place.

I soon headed to a neighborhood south of Buffalo. Passing cookie-cutter houses,

Figure 1. A "haunted house" outside of Buffalo, New York, the site of ghostly footsteps and attacks. All photos by Benjamin Radford.

Tom summoned a priest to bless the house on October 30, but the exorcism failed, and the disturbances got worse.

I soon found the place: a somewhat rundown but respectable two-story, pale-blue building, as can be seen in figure 1. The houses were close together, separated by little more than short, concrete driveways leading to tiny backyards. As I gathered my tape recorder, camera, and notebook, a woman in her late twenties hesitantly poked her head out the door. I climbed onto the porch, where she introduced herself as Monica. Her husband, Tom, a stocky, Hispanic man of about forty, shook my hand and led me through a dimly lit living room. We walked into the kitchen, where I took a seat at a small dinette table and interviewed the couple.

Monica and Tom, with their two-year-old daughter, had lived in the house for about three years. The couple slept in separate bedrooms, both upstairs. Tom suffered from apnea, a sleep disorder, and used a machine that forced air into his nose while he slept. Monica slept in an adjacent room with their daughter. Most of the ghostly events happened just as Tom was drifting off to sleep. Tom was almost always the main person affected, and he was the first to hear the sounds. Sometimes when they were both downstairs, they would hear steps on the house's creaky staircase.

The disturbances were sporadic but had recently increased. The wife said, "It got more active when he said to me [on October 27], 'You know, Monica, I hear this, it is pulling my machine,' and I said, 'I hear it too, or I feel it, too.' When we admitted it to each other, it got tremendously worse. It started the Monday before Halloween, and then it got really bad." Tom summoned a priest to bless the house on October 30, but the exorcism failed, and the disturbances got worse. Later that night, the family fled their home and were afraid to return. Both Monica and Tom were convinced that some sort of spirit was residing in their house. Monica said, "If somebody had come to me and said that there was a ghost in the house, I would have never believed them until I lived through what I lived through here. . . . We just want to move back into our home."

Haunting Phenomena

The family cited many unexplained phenomena that led them to believe they were being haunted:

1. Tom felt a hard tapping on his feet, near his ankle. This almost always happened at night in bed while he was going to sleep (or while he was asleep). "I get a tapping on my feet, not a repetitive tap, a trying-to-wake-you-up tap." This happened three or four times. Since then, Tom said, "I won't sleep in this room."

2. On at least one occasion, Tom said he was physically attacked by the spirit. Tom's bed shook as if from a ghostly kick. "If I don't pay attention to it [the tapping], it will kick the bed—it will hit the side of the bed. I feel my whole body move. . . . Then, if I go back to sleep, I start to get a sound sleep, that's when it kicks again."

3. The couple sometimes heard footsteps in the vacant hallway and stairs. The stairs were incredibly creaky, and the sound distinctive. "After a little while, you'll hear walking up and down the stairs. So I think it's my wife, getting up to go to the bathroom or something, and I don't see any lights on, so I get up to look, and I turn the lights on, and nothing." Monica, who said she doesn't get up much at night, described "constant walking, up and down the stairs all through the night, from midnight until six in the morning."

4. At one point, Monica suggested that they take photos of the darkened house's hallways, rooms, and corners. "If you take pictures in the dark, you should be able to see things," Tom said, showing me a small stack of photos. While most of them were very ordinary, the couple pointed out three or four that seemed to show strange white orbs, pinpoints of light, and an eerie, inhuman face reflected in a tabletop. Tom showed the photos to a local radio psychic, who, he said, told him that his "house was full of ghosts."

5. While downstairs, the couple sometimes heard faint music or odd noises coming from upstairs. On October 30, prompted in part by mystery-mongering books and television shows, the pair investigated on their own, placing a tape recorder at the top of the stairs to record any ghostly sounds.

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They waited downstairs and did not hear anything at that time. But, upon listening to the tape, they heard one or more faint but distinct voices, various sounds, and what could have been a dog barking. I asked if it could be their dog, but Tom pointed out that theirs is a small breed (Pomeranian) that sounds different. He also dismissed the idea that passersby on the sidewalk might have made the noise, saying that people don't walk their dogs in his neighborhood at night, and besides, Monica and Tom couldn't hear street sounds from downstairs. "What I heard on the [audio] tape scared the shit out of me," Tom said—the conclusive evidence that convinced the couple (and Monica's parents) that the house was indeed haunted. That night, they left the house and refused to return. Many ghost investigators claim that they can record voices of the dead using microphones in empty (but supposedly haunted) areas.

6. Tom claimed that the family pets were afraid to enter his room and sometimes acted strangely. "The cat won't come in my bedroom. . . . He will stay right here [at the doorway], look, and walk right back out."

7. The couple complained of strange "cold spots" in the house and claimed that the upstairs would often be cold. "If you go upstairs, it's cold," Monica said. "My room is like the master bedroom of the house, and it's always like there's no heat up there. We always thought heat rises and the upstairs is always warmer than the downstairs."

Investigating the House

After I got the basic facts of this case, Tom led me on a tour of their house. My first impression of the house was that, ghost or no, it was a strange and dark place. The house was not in great shape even though it had been extensively remodeled; some places had peeling paint, baseboards that were not flush, and minor cracks in the walls and ceilings. The upstairs, in particular, had unusual features, such as half-doorways leading to irregularly shaped storage spaces. The stairway was remarkably squeaky, straight out of a haunted-house film. Many of the rooms, especially those downstairs, seemed strangely dark even during the daytime.

We entered Monica's bedroom, and I asked for quiet so I could get a sense of the house's ambient sounds. There was a mild wind outside, and a few normal snaps and creaks could be heard. As I listened, I heard two muffled, mysterious scraping sounds coming from just below us, or just outside the window. Ghostly moans beyond the grave? Bloody fingernails on a rusty screen door? I looked through the window, but it was covered with opaque, plastic sheeting for insulation: I didn't see any figures moving. I stepped away from the window, and Tom went to look. "There's nobody there," he said soberly. Both of them looked spooked. I quickly walked out of the room, down the squeaky stairs, through the living room, down the porch, and into the front yard. Monica and Tom followed behind me. I asked them which side of the house we had just been on. Tom pointed to the left side of the house, and I peered back between the houses.

A maroon truck and a black car were parked in the driveway, with a low picket fence just beyond. I didn't see anything moving—no tree branches brushing against the roof, nothing that might have made the scraping sound. It seemed to be a genuine mystery, but a few moments' more patience paid off.

As I watched, an old woman's head and shoulders suddenly popped into view from behind the car. I then saw a rake in her hand and heard the distinct scraping again: a neighbor was raking leaves. When the "ghost" noticed me, I took a photo and gave a polite wave.

We went back inside, and I told them I'd like to experience the haunting and asked when they would be available to be in the house after dark. They said I could come over later that night. I headed home; in the twilight, a few people wandered the sidewalks and streets, including a young man walking a dalmatian.

"If somebody had come to me and said that there was a ghost in the house, I would have never believed them until I lived through what I lived through here. . . . We just want to move back into our home."

I returned to the house around 10:30 P.M. The night was unusually blustery, definitely appropriate for a haunted-house stakeout. (In fact, the windstorms that night knocked out power to many areas of Buffalo and the Eastern Seaboard.) Monica and her daughter had refused to return to their haunted home, but Tom was there to greet me. I told Tom to do all the things he usually does: turn on or off any lights that are usually on or off, close whatever doors are normally closed, etc. While we waited for any ghostly phenomena, I asked him more about his job. He'd been at the same factory job for thirteen years, driving a forklift at a nearby Ford plant. He often worked from 3 P.M. until 11 P.M., though that had changed around June or July. At that time, he had adopted a new work schedule, 7 A.M. to 3 P.M. He had occasionally felt tapping on his feet at night but ignored it. Tom said that "It got a lot worse when I got the 7 to 3 shift."

Tom looked over at me between draws on his cigarette. "Can they follow you?" he asked. I told him that if there was something in his home, I didn't think that it would pursue him anywhere else; most likely it would remain confined to the house. If worse comes to worst, his family could just move out. I asked Tom what he thought was going on. "I think there's something going on, a spirit or something—a pissed-off spirit."

I suggested we head upstairs to listen quietly for sounds, if

Figure 2. A tape recorder placed at the top of the "haunted" staircase waits to capture ghostly voices.

My presence helped put them at ease, but I hadn't explained the audiotape of the ghostly voices, the ghost's kick attack, or much else.

they were to come. "Oh, they will. They usually do," he said. We watched and waited as minutes turned to hours, but nothing happened: no ghostly voices, no creaking, vacant stairs, no unusual sounds or events. Tom seemed puzzled by the silence but offered no explanation. Finally, at just past 1 A.M., I left.

In the following days, I struggled with what to tell the couple. I had not seen any evidence of any paranormal activity, so far, but I knew they were genuinely scared. My presence helped put them at ease, but I hadn't explained the audiotape of the ghostly voices, the ghost's kick attack, or much else. I wanted the family back in their home by Thanksgiving, and the clock was ticking.

I had an idea for an experiment, but it would have to be done on a calm day, without the howling winds which had recently battered Buffalo.

More Experiments and Investigation

I returned to the house on the following Saturday. When I arrived, I had an audience; in addition to the family, Monica's mother was there, as were two of her friends. As I set up, I realized why the downstairs interior was often dim: the walls were painted light brown. Even with two lamps on, the place was quite dark, because the walls absorbed much of the ambient light. The walls had originally been white, but, because they showed dirt and imperfections, Tom had repainted with tan-colored paint he had found in the basement.

While the family sat around the living room, sometimes watching me curiously, I took measurements of the stairs and unpacked my camera gear. It was time for an experiment. I asked everyone to leave the house except for Monica, who sat in the living room. I instructed Tom to put the small tape recorder, seen in figure 2, in exactly the same position he did the evening of October 30. I turned it on, and we walked down the stairs and out into the driveway by the sidewalk below the windows that faced the staircase. We talked about the weather, and Tom commented that the conditions were exactly as they had been the night he recorded the audiotape: no wind and very calm. We spoke for about five minutes, then went back up to get the tape. I wanted to see if normal voices could be recorded from across the staircase, through the plastic-coated windows, and out toward the sidewalk.

I rewound it and played it in front of Tom and Monica. Indeed, our conversation was muffled but clearly audible. Though I hadn't analyzed the audiotape yet, the sounds and voices they recorded upstairs were almost certainly from beyond the house instead of beyond the grave. Aside from that, if it was a ghost or spirit, why would it create such mundane sounds as a barking dog or faint conversation, exactly mimicking ambient street noise?

The most likely explanation is that these normal sounds had been seen as strange in the context of other odd noises, feelings, and fear. The couple agreed with my explanation, but Tom reminded me that I hadn't yet explained the tapping he felt on his foot at night. "I want to see if you can explain that." I nodded as I scribbled notes. "I'm working on it," I said. "One thing at a time."

For my next experiment, I scooped up Scrappy, the pliant, orange calico cat in figure 3, and took him with me upstairs to Tom's room. Tom, taking a cue from the many books on ghosts that he and his wife had consulted in the past weeks, said that the animals would refuse to go in the room or acted strangely if they did. With a camcorder running, I placed the cat in the middle of the room to see if he would hiss, scamper out, or react in any unusual way. Instead, the cat sat there looking at me and soon came over to be petted. If he sensed any supernatural spirits, Scrappy didn't show it as he purred and enjoyed a scratch behind the ears. Another mystery evaporated.

As I packed up, I told Tom and Monica that I would be willing to come back that night for one more ghost stakeout. Since I had been told that the steps and squeaking happen "constantly"

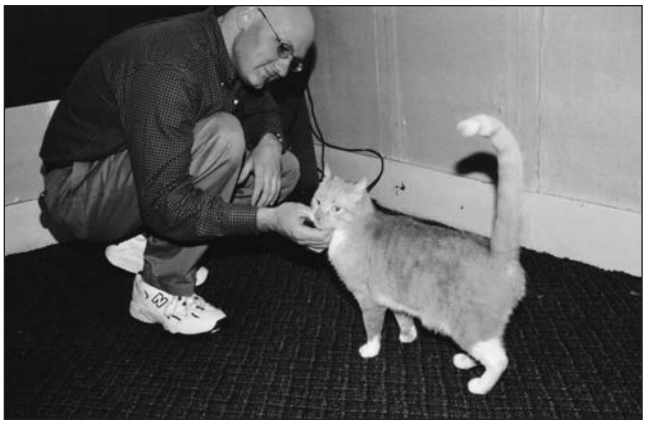


Figure 3. Author/investigator Radford testing Scrappy the cat's reactions to a "haunted" bedroom.

throughout the night, it seemed that surely a second night in the haunted house should provide some evidence. Both said they'd like that, so, about seven hours later, I returned.

I arrived just before 11 P.M.; Tom met me at the door and led me into the living room where their daughter was asleep on a sofa, near Monica. Tom had slept there the night before without incident. This was the first time Monica had been in the house at night in the last two weeks. Both felt comfortable enough downstairs (on the sofa and floor) while I was there, but neither would sleep upstairs. Tom showed me a new light fixture he was installing at the base of the stairs, shining a bright light not only up the stairs but also into the hallway. I told him I thought that was a very good idea, as was contacting a carpenter or contractor to get rid of the stairway's noisy creaks and squeaks.

I sat on the couch, my camera and tape recorder at the ready. We all listened intently to the house sounds: the clock in the kitchen, the songbird clock chime, the fish tank bubbles and chirps. We sat in silence for an hour, until just past midnight. We made small talk, and the pair chain-smoked as the minutes ticked by. Tom asked me if I had looked more closely at the photos they had taken. I had taken the negatives to a professional developer and asked for a print of the image with the demonic face all the way to the edge of the frame. (When prints are made, the operators typically center the image, which can leave out important information.)

I explained that, if a person takes enough photographs, eventually he or she will find a few that apparently have odd lights or reflections. The photographs taken in the house did not show anything unusual or paranormal. There were a few anomalies, such as a few white specks and dots, but they were clearly common artifacts of the photography (such as flash reflections) and processing (such as specks of dirt). It is important to note that the camera was not of good quality, the photographer was an amateur, and the developing adequate but not of high quality. Some self-styled ghost hunters try to claim that the "orbs" are images of ghosts, but this is due to photographic inexperience and ignorance. (For more on orbs, see "The [Non]Mysterious Orbs," SKEPTICAL INQUIRER, September/October 2007.) The demonic face Tom and Monica had seen was clearly a simulacrum, as I showed him with an enlargement. People see such faces and images in everything from stains to dirty windows

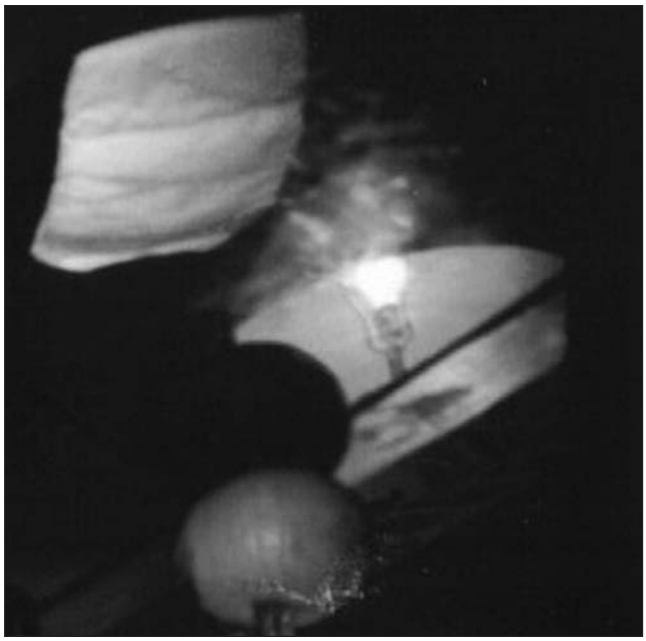


Figure 4. The "demonic face" seen by the homeowners when they began their own investigation. (Face is on the lampshade.)

to clouds. I showed Tom that the demon's face was simply a lamp reflected off a glass tabletop, as can be seen in figure 4. "That could make sense," he admitted. "But I want you to make sense of the tapping I felt. . . . Everything else you can find an explanation for, but you're not going to find out about the tapping. You're not gonna find out [about] the kick in my bed." Monica sleepily pulled a blanket over herself.

I told them that I wasn't done yet, but that as far as I was concerned, they should not be worried about staying in the house. Though the incidents had been alarming and scary, no one had been harmed, and they apparently did not feel personally threatened. I walked to the top of the stairs and sat at the top landing, waiting for something unusual or paranormal to happen. After about fifteen minutes, the only thing I was feeling was chilly. I realized that there was indeed a cold spot near the top of the stairs, and I could feel cold air drifting past my waist. I announced I was coming down (so as not to startle them with the stairway sounds) and asked if they had any incense. Tom got off the floor and brought me a lit vanilla stick from the kitchen. I took it upstairs and held the incense at the bottom of the doorways. I shined my flashlight on the smoke stream, and it was clear that the cold was not a "cold spot" at all but instead simply a cold draft coming from the poorly insulated bedrooms. I then asked Tom to join me and showed him my findings. He agreed that the "cold spot" was, instead, a draft, and marveled that a ten-cent stick of incense could be as good an investigative tool as a $10,000 infrared camera. As always, the value is in the methods, not the tools.

At one point, I left my chair at the top of the steps to retrieve a camera tripod. When I returned, Tom said he heard tapping right after I left. "A tap [on the wall] like letting you know, 'Yeah, I'm here.'" I had left my tape recorder on while I was gone, but when I listened to it, I didn't hear anything strange or unusual. Yet, even if something had been recorded,

the sound could be anything; short of Morse Code, I'm not sure what would distinguish a "regular" tapping sound from one that seemed to be a message indicating, "Yeah, I'm here." Tom's mind was clearly interpreting ordinary sounds in extraordinary ways.

I waited another hour or so, finally leaving after 1 A.M. I had been ready and willing to experience and record the ghostly footsteps, but for the second time, the ghost activity had failed to materialize. Perhaps the spirits were just shy with a skeptic around, but without any evidence, there was little I could do. The creaking stairway and footsteps seemed to be the house settling, normal noises, products of imagination, or sleep-induced hallucinations. There was no evidence of anything else.

People misunderstand and misperceive things all the time; it doesn't mean that they are stupid or crazy, just that they do not necessarily know what to look for.

With mother and daughter asleep in their home for the first time in weeks, I packed up my gear and headed out. I told Tom I'd meet with them the following week, but for the time being, I thought everything would be fine. As I left, Tom suggested that maybe the spirits had gone, that it was over. I heartily agreed, suggesting that, if they did hear anything, they should just try to ignore it. If something was there at one point, it certainly didn't seem to be around anymore.

I called the following Monday and was told that no further activity had occurred. They felt the haunting might be over. I went to the house one last time to discuss the results of my investigation point by point. The kicking and the tapping were among the most puzzling phenomena and first on the agenda. The tapping on Tom's feet was most likely his imagination, a medical condition, or both. The fact that it invariably happened when he was going to sleep—or, by Tom's own account, actually asleep—is significant. This might be considered a hypnagogic hallucination (a sensory illusion that occurs in the transition to sleep), a fairly common phenomenon that can easily lead to misperceptions.

Tom was particularly disturbed when his bed was "kicked" by an unseen entity. I examined the metal-framed twin bed and found it to be fairly lightweight (Tom had carried it into his wife's room by himself). It is significant that the bed only jerked at night when Tom was in the bed and going to sleep. Several days into my investigation, I discussed the case with a police officer, who said that, when he is drifting off to sleep, his arm or leg will often twitch or jerk. In fact, his wife told me that, just the previous evening, her husband's leg had twitched as he was going to sleep and had not only shaken the bed but woken her up. It is not unusual for people to do that in bed; I have done it myself. It seems likely that Tom, as he drifted to sleep, had simply twitched or jerked, causing the bed he was on to shake. Tom, at over 250 pounds, was a big man, and a leg spasm could easily shake the lightweight bed. The fact that Tom has sleep apnea is even further evidence for this explanation; restless legs (restless leg syndrome) is actually one of the most common symptoms of apnea.

The ghostly activity coincided with a change in Tom's work (and, therefore, sleep) schedule. The strange events were infrequent and minor until Tom told his wife about what he had been experiencing. "When we admitted it to each other, it got tremendously worse," Monica said. With my background in psychology, this struck me as very strong evidence for a psychological explanation. It seems a near-classic case of each person reinforcing the other's expectations and interpretations of strange events. The fact that all this occurred right before Halloween might also be significant; it is the season when ghosts, spooks, witches, and spirits are in the public's consciousness. Tom said that the haunting had stopped, and they would be spending Thanksgiving in their own home.

People misunderstand and misperceive things all the time; it doesn't mean that they are stupid or crazy, just that they do not necessarily know what to look for. Much of this case was simply a collection of unrelated and mundane phenomena that, taken together and in the context of a possible haunting, seemed to be evidence for supernatural activity. Monica and Tom tried their best to understand and explain them. When that failed, they tried to record the events—but misinterpreted their findings. Normal ambient noise became mysterious ghostly voices; normal photographic glitches and artifacts became unexplained lights and faces.

In a very real way, Tom and Monica haunted their own home. As the weeks passed, Monica sought out books about ghosts and hauntings, none of which were skeptical or science-based. These served as a haunting blueprint for the couple and told them what signs to look for in a haunted home, and sure enough, they found them.

This terrified family and their (non)haunted house is a result of a society in which those seeking answers to strange phenomena are directed to the local bookstore or library shelf, only to find mystery-mongering misinformation by the ream and few skeptical resources. Popular books, television shows, and even a local "psychic" all made the problem worse. In a Halloween 2007 interview on ABC's *Nightline*, Grant Wilson of the TV show *Ghost Hunters* said, "I don't care at all what the skeptics think of what we're doing because they don't need help. There are people who need help in their homes. Who's helping them? Are the skeptics going to help them? No! In fact, it's often skeptics who help families terrified by misinformation from "experts" such as the Ghost Hunters." In this case, and in many others, it is science and skepticism that solved the mystery and made a real difference in these people's lives.

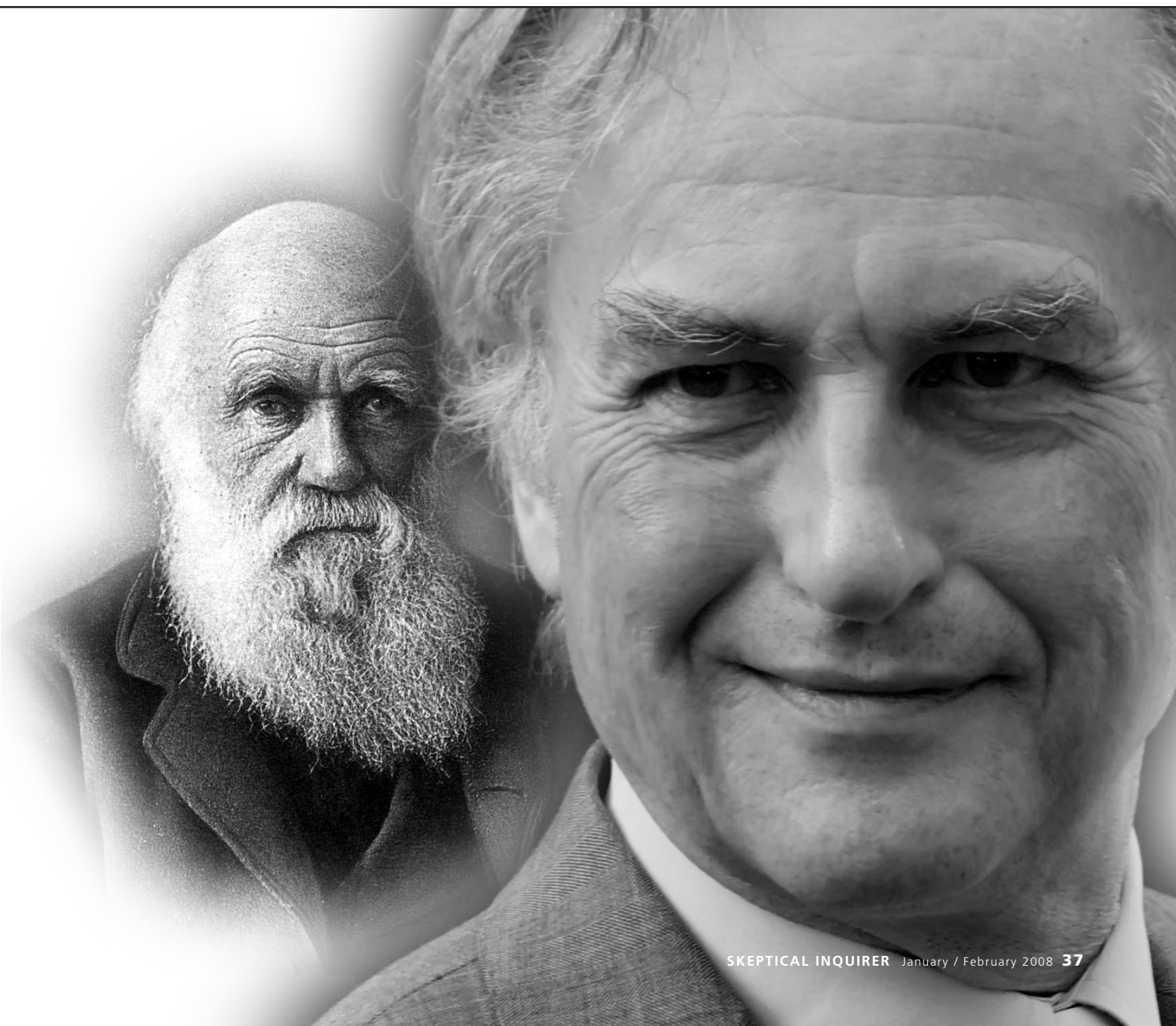
Note

Respecting a request for anonymity, names have been changed except for the cat. A more detailed examination of this case is available online at www/csicop.org/specialarticles/. □

A Darwinian View of a Hostile Atheist

The frontal assault on religion by Richard Dawkins in his book The God Delusion, *and by others, may mark a new chapter in the warfare of science with theology.*

IRWIN TESSMAN



Richard Dawkins's book *The God Delusion* (2006, reviewed by Kendrick Frazier in the March/April 2007 SKEPTICAL INQUIRER; see also, Massimo Pigliucci, "Is Dawkins Deluded?" SI, July/August 2007) has attracted much attention. My initial encounter with the book, in which I only read a sampling of pages, gave me the recurrent thought: why is he so angry? As if Dawkins was aware that readers were likely to ask this question, he headed a chapter "Why Be So Hostile?," in which he explained his belief that too many religions are evil, that they have been responsible for much of human misery, and perhaps the worst, that they deeply offend the scientific mind.

But without religion and God, where will our sense of morality come from? Specifically, what accounts for altruistic behavior? Charles Darwin, anticipating atheists such as Dawkins, believed that altruism is an adaptive trait and, therefore, evolved by natural selection.

Dawkins is well known for his books *The Selfish Gene* (1976) and *The Blind Watchmaker* (1986), among others, which popularized the field of evolutionary science with particular emphasis on the gene as the unit of natural selection. Dawkins's writings are noted for their clarity, logic, and wit. Appropriately, he has been Charles Simonyi Professor for the Public Understanding of Science at Oxford University since 1995.

The God Delusion attempts to contribute to the public understanding of what Dawkins and others see as a war between science and religion. Dawkins is an ardent Darwinian and militant atheist. He is on the frontline opposing religion in hopes of encouraging wavering skeptics to join the atheist ranks. The word *Delusion* in the title sets a belligerent tone. He seems to be saying, "If you still believe in God after reading this book, it is likely you are mentally disturbed."

Darwin's Views of Religion

Darwin, in his *Autobiography*, appears to have anticipated much of what Dawkins has to say on religion. When the *Autobiography* was first published five years after Darwin's death, it was an expurgated version (Darwin 1887). Now we have the complete text, which was edited by his granddaughter, Nora Barlow (Darwin 1958). All omissions were restored, particularly the section headed "Religious Belief."

Some in Darwin's family, including his wife, Emma, felt his reputation would suffer irrevocably if his lack of conventional religious belief were widely known. Emma successfully argued for the purging of sensitive remarks from the public text in a letter to her son Francis in 1885: "There is one sentence in the *Autobiography* which I very much wish to omit, no doubt partly because your father's opinion that *all* morality has grown up by evolution is painful to me. . . ." It is unsettling to realize that we might not have learned of Darwin's profound idea for seventy-one years if Darwin had not already openly published it in *The Descent of Man* (Darwin 1871, pp. 161–166).

Darwin describes his slow but complete loss of faith (italicized passages are those that were originally expurgated): "Whilst on board the *Beagle* I was quite orthodox. . . . But I had gradually come, by this time, to see that the Old Testament *from its manifestly false history of the world . . . and from its attribution to God the feelings of a revengeful tyrant* was no more to be trusted than the sacred books of the Hindoos [*sic*], or the beliefs of any barbarian."

Darwin's theory of evolution by natural selection undermined the conventional religious concept of an all-powerful God. It could explain in a natural way the existence of complex organisms without the need for an intelligent designer, a term made popular by the Reverend William Paley.[1] In an argument familiar to us today, Paley asserted that the incredible perfection of the human eye could not be explained by any hypothesis other than a supernatural one. Many were convinced that Paley had proved the existence of God because no competing plan existed. But that was simply only a matter of time. Darwin himself confessed (1958) that he, too, was at first convinced by Paley that God must exist, but that lasted only until a much better theory—natural selection—came along. That better theory made God superfluous in Darwin's view.

His aversion to Christianity was explicit. For example (Darwin 1958, pp. 86–87), "By further reflecting that the clearest evidence would be [required] to make any sane man believe in the miracles by which Christianity is supported . . . that the men at that time were ignorant and credulous to a degree almost incomprehensible by us . . . disbelief crept over me at a very slow rate, but was at last complete.

"I can indeed hardly see how anyone ought to wish Christianity to be true; for if so the plain language of the text seems to show that the men who do not believe, and this would include my Father, Brother and almost all their best friends, will be everlastingly punished. . . ." Charles's father, Robert, also a nonbeliever, warned Charles that he would be wise to keep his religious feelings to himself because few of his acquaintances would understand his lack of faith.

Dawkins's Views of Religion

Dawkins is equally passionate in his own condemnation of the Old Testament. He writes that the God of the Old Testament is "arguably the most unpleasant character in all fiction: jealous and proud of it; a petty, unjust, unforgiving control-freak;

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a vindictive, bloodthirsty ethnic cleanser; a misogynistic, homophobic, racist, infanticidal, genocidal, filicidal, pestilential, megalomaniacal, sadomasochistic, capriciously malevolent bully" (Dawkins 2006, p. 31). This is classic Dawkins.

Dawkins has his crosshairs on the personal God, which makes a clear target of what most believers believe in. A personal God is one who is concerned with us individually, listens to our prayers sympathetically, and responds favorably to our requests. In many cases, the personal God takes an interest in our behavior, he punishes and rewards us and from time to time performs a few miracles (which are often recognized only in retrospect).

Dawkins agrees with Darwin that evolution challenges the concept of a personal God. He concedes, however, that the implications of evolution appear damaging to his cause: (1) Evolution implies denial of a personal God; (2) Lack of a personal God is equivalent to atheism; (3) Therefore, evolution implies atheism. Creationists now feel free to equate evolution with atheism. Since most people in the United States consider atheism unquestionably false (Dawkins 2006), for them it follows that evolution must likewise be false and we ought to fall back to Paley's intelligent design, a bitter result.

Next to Darwin, Einstein is most utilized by Dawkins, occupying nearly the entire lengthy first chapter. It allows Dawkins to repeat what most physicists know: that Einstein, like many other physicists, had the habit of referring to God metaphorically—e.g., "God is subtle but he is not malicious"—in which case God might represent the Universal Laws of Nature. Einstein emphatically rejected the notion of a personal God with obvious feeling (Dukas and Hoffmann 1979, p. 43).[2] Dawkins seems unable to pass up any chance, no matter how anecdotal, to identify highly accomplished people who are also atheists. Einstein is a particularly good catch. Why does Dawkins do this? First, it seems quite natural to be curious about the religious views of such an eminent scientist, and Dawkins's chapter on Einstein goes a long way in satisfying that curiosity. But there is more to it here. Dawkins was responding to religious people's claims that many outstanding scientists are religious.

He describes the poll published in *Nature* (Larson and Witham 1997, 1998) depicting scientists' views about religion. In contrast to the roughly 90 percent of all Americans who believe in a personal God, the number drops to 40 percent among scientists in general and plummets to 7 percent for a class of outstanding scientists—defined as members of the National Academy of Sciences. Dawkins continues to reiterate his point with comparable statistics about recipients of Nobel prizes. Both sides seem to be playing the same publicity game. Dawkins describes "[t]he efforts of apologists to find genuinely distinguished modern scientists who are religious" as having "an air of desperation…" (2006, p. 100).

Dawkins invents a nearly subliminal version of the game. Conceding that some scientists are sincerely religious, Dawkins describes one of them, Francis Collins, a devoutly religious evangelical Christian, as the "*administrative* head of the American branch of the official Human Genome Project" [emphasis added]. He doesn't refer to Collins as simply the head or the director (which he was) of the project, but gratuitously tries to diminish his role by implying Collins's role was only *administrative*. In the very same paragraph, he refers to his friend Jim Watson, who is strongly irreligious, as the "founding *genius* of the Human Genome Project," ignoring the fact that Watson could *also* have been labeled as the *administrative* head of the Human Genome Project before he resigned under fire and was eventually replaced by Collins, who saw the project to its completion.

Dawkins has his crosshairs on the personal God, which makes a clear target of what most believers believe in. A personal God is one who is concerned with us individually, listens to our prayers sympathetically, and responds favorably to our requests.

Ignored by Dawkins is the pioneering leadership of Collins in the successful search for, and sequencing of, genes involved in cystic fibrosis, neurofibromatosis, and Huntington's disease. Ignored also was the election of Collins to the National Academy of Sciences in 1993. And then, to rub it in, Dawkins inserts a footnote cautioning the reader not to confuse the *official* genome project with the *un*official one, which was "led by that brilliant (and nonreligious) 'buccaneer' of science, Craig Venter" (Dawkins p. 99). Venter was elected in 2002 into the same section of the National Academy that Collins was in.

Why do I devote so much space to such petty stuff? To make two points. The first is that Dawkins recklessly implies that smart scientists are the best judges of whether there is a God. It is conceivable that scientists, most especially outstanding scientists, are too engrossed in their scientific studies to give much intellectual thought to the subject of religion. It is important to remember that nothing in science gets resolved by authority, but rather by the voice of reason. My point is that Dawkins weakens his case by unnecessarily including a weak argument. Added to that is my second point, which is to expose bias in Dawkins's presentation and to question his objectivity.

Natural Selection versus Randomness

Natural selection proceeds in small mutational steps that depend on the random occurrence of DNA mutations. In what

sense, therefore, can the process be said to not be random? It is easy to see how people could be confused. The process is not random because of selection. Only those mutations that confer significant, albeit small, benefit (under local environmental conditions) are selected and so may seem to occur with considerably greater probability than random occurrence would allow.

Dawkins goes to pains to point this out in order to counter the intelligent designers who rule out natural selection on the fallacious charge that it is a random process and therefore must be improbable. This is fundamental; it would seem that any reader who doesn't understand that point could not fully appreciate Darwin's theory of evolution by natural selection

While in his take-no-prisoners mode, Dawkins asks what it is that religion has taught us. His answer: nothing. In this he goes up against Stephen Jay Gould.

and should be offered a helpful explanation, preferably one showing semi-quantitatively the advantages of natural selection.

Consider Dawkins's explanation of how natural selection takes the random out of random mutations to greatly increase the probability of evolving an adaptive version of a gene:

> What is it that makes natural selection succeed as a solution to the problem of improbability, where chance and design both fail at the starting gate? The answer is that natural selection is a cumulative process, which breaks the problem of improbability up into small pieces. Each of the small pieces is slightly improbable, but not prohibitively so. When large numbers of these slightly improbable events are stacked up in series, the end product of the accumulation is very very improbable indeed, improbable enough to be far beyond the reach of chance. It is these end products that form the subject of the creationist's wearisomely recycled argument. The creationist completely misses the point, because he (women should for once not mind being excluded from the pronoun) insists on treating the genesis of statistical improbability as a single, on-off event. He doesn't understand the power of *accumulation*. (Dawkins 2006, p. 121)

Correct, but does that sound like the author of *The Selfish Gene*? I believe it is appropriate to quote Einstein, Dawkins's inspiration, in this context. "Most books about science that are said to be written for the layman seek more to impress the reader . . . than to explain to him clearly and lucidly the elementary aims and methods" (Dukas and Hoffmann 1979, p. 41).

Intelligent-design advocates are keen to argue that you cannot disprove the existence of God. That may be true, but Dawkins argues that there are innumerable things we cannot disprove, and that God is merely one more. The burden, he says, should be on believers to prove God's existence. He resorts to Bertrand Russell, the famous English mathematician and one of the twentieth century's greatest philosophers. Russell proposed, for the sake of argument, that there is a teapot in orbit between the Earth and the Sun too small to see with a telescope. You cannot prove the teapot is nonexistent. Would you therefore propose that it has a reasonable chance to exist? If you list innumerable similar items—unicorns, Zeus, Egyptian gods, etc.—and you assign each a practical chance, then inevitably it becomes almost certain that at least one of them must exist.

Where does Darwin stand on the matter of a personal God? "The old argument of design in nature, as given by Paley, which seemed to be so conclusive, fails now that the law of natural selection has been discovered. We can no longer argue that, for instance, the beautiful hinge of a bivalve shell must have been made by an intelligent being, like the hinge of a door by man" (Darwin 1958, p. 87). Darwin seems to reject the idea of a personal God and, therefore, theism too. His religious views are difficult to pin down (Browne 2006, p. 46), but something close to deism would seem to fit.

Theism is a belief in a personal God, one who responds favorably to prayers and interferes in daily events; atheism is the opposite of theism. Deism is the belief in a God who set the universe in motion with all the physical laws and both sacred and learned commentaries, but was absent after that. In practice, deism is much like atheism.

Morality (and Altruism) Without God and Religion

It is often taken for granted that a moral code requires God and religion. Why be good if there is no God? Believers ask how atheists could be moral inasmuch as they seem to deny any fear of God's punishment for immoral behavior. We saw that Emma Darwin expurgated from her husband's *Autobiography* his conviction that morality is established by natural selection, implying that religion was not a significant factor. On this question of morality, Dawkins is a staunch disciple of Darwin and emphasizes the view that the conventional role of religion is delusional.

While in his take-no-prisoners mode, Dawkins asks what it is that religion has taught us. His answer: nothing. In this he goes up against Stephen Jay Gould. The two frequently fought intellectually. In Gould's scheme, there are two nonoverlapping realms of knowledge. He called them NOMA: Non-Overlapping Magisteria. Science answers objective questions about how the universe works (empirical questions); religion answers the ultimate questions: why am I here, what is the purpose of life, what is the basis of morality?

Dawkins will have none of that. It may turn out, he says, that there are meaningful questions that science cannot han-

dle, but why should we assume that religion is equipped to answer them? What do theologians know that enable them to handle such questions better than science? Again: nothing. He is completely scornful of theologians and is even skeptical that theology is a field of knowledge. None of this should come as a surprise; theologians have long claimed authority over questions that science had not yet answered. In the course of time, however, the theologians were forced to retreat—with lengthy rearguard action (White 1896).

Dawkins's defiant dismissal of theology reminds me of the challenge E.O. Wilson made at the end of his tome on *Sociobiology* (1975, p. 451): "Scientists and humanists should consider together the possibility that the time has come for ethics to be removed temporarily from the hands of the philosophers and biologicized." Its time may have come.

Moral sense is the ability to judge good from bad. As such, believers conclude that our moral inclinations come from God. Altruism, which implies a concern for the welfare of others at the expense of oneself, appears as a higher form of morality.

I have defined altruism as behavior "that increases the reproductive fitness of others at the *apparent* expense of the altruist" (Tessman 1995). "Apparent" because from an evolutionary point of view it turns out that several forms of altruism unexpectedly benefit the altruists, that is, they are really selfish and not selfless behaviors. Darwin upset his family by proposing that altruism, which he saw as a key element of morality and a distinctly human activity, evolved by natural selection (Darwin 1871).

It is now commonly argued that some altruistic behavior is genetically determined, and that altruism may have a selective advantage. The earliest and arguably most influential was William D. Hamilton's explanation of altruistic behavior among the social insects that is controlled by a haplo-diplo sexual system (Hamilton 1964). In that case, a female is more closely related to her sister (75 percent) than to her own offspring (50 percent), which accounts for her devotion to raising sisters in preference to her own offspring—with the false illusion of selflessness.

Critical insight into the motivation for altruistic behavior can be found in a quip by essayist Charles Lamb (1834): "The greatest pleasure I know is to do a good action by stealth and have it found out by accident." Having it found out by accident is designed to suggest indifference to credit for the altruistic deed and therefore imply (falsely) the purity of the act. The admission of a secret wish to be found out, however, exposes the truly selfish nature of the act. It is a shortcut to a good reputation, and what is a good reputation good for? R.A. Fisher, cofounder of modern statistics, tells us one important benefit of a good reputation: "The wooer relies on his reputation even for the decision of the lady herself" (1958, p. 266).

That is why I have suggested that human altruism may serve as a courtship display that has successfully evolved by natural selection. I have offered a simple example that arose in Jane Austen's *Pride and Prejudice* which I find convincingly illustrates my point, although its scientific value may be arguable.

"An altruistic act is performed [by Mr. Darcy] without apparent publicity or hope of reward, but the author contrives to have Darcy's beneficence revealed to his love, Elizabeth. In this case the altruism clinches Elizabeth's developing affection and secures her hand in marriage." The courtship strategy was successful.

As suggested by science author Matt Ridley, another literary example of the perverse courtship role of altruism is consciously employed in the classic erotic tragedy *Les Liaison Dangereuses* by Pierre Choderlos de Laclos (1782). The Vicomte de Valmont, the amorous protagonist, acts out an impressive display of seemingly pure altruism to capture the heart of his victim. He is successful, in part because he ensures that his contrived altruism is revealed to her with no hint of his complicity.

Francis Collins presses the view that there is indeed a selfless, godlike purity and virtuousness to at least one form of altruism that opened his eyes to God's presence and gave him a sure glimpse of God's work (2006). And we are invited to walk the same path to view God's certain existence. With the growing literature on the evolution of altruistic behavior, though, Collins is painting himself into a corner. It looks as if he will eventually provide yet another example of science forcing the retreat of supernatural theories (White 1896).[3]

Dawkins adds an exclamation point to the question of whether morality is possible without religion. Isn't religion the source of moral behavior? Dawkins suggests the opposite. If we are attracted to a religion because it advocates a particular philosophy that we find morally attractive, doesn't it mean that we have an internal appreciation of morality? We may well be genetically programmed internally to favor certain moral convictions. In other words, it would be *we* who shape religion, contrary to the conventional wisdom that religion shapes *us*. That may have alarming implications: if humans shape religion then we must have shaped the evil behavior that so moves Dawkins to anger.

I return to Dawkins's confession of being on a mission to recruit new atheists. Once again, Darwin is a source of thoughtful comment. He adopted an understanding attitude with a compassionate tone. He said, "At the present day the most usual argument for the existence of an intelligent God is drawn from the deep inward conviction and feelings which are experienced by most persons" (Darwin 1958, p. 90).

He himself was not such a believer. He believed that natural selection doomed intelligent design by providing a natural explanation for evolution. Darwin and Dawkins are alike in many ways, but with at least one striking difference. Dawkins is an active fighter in a war with religion for reasons Darwin shared, but Darwin, defended by friends who were willing to fight in the trenches, was apparently content to let them go to the front while he worked effectively behind the lines.

A notable event was the recent emergence from the nontheistic closet of a public official, Congressman Pete Stark of Fremont, California, who announced that he did not believe in a supreme being. Will other public officials do likewise?[4]

It will be fascinating to see if Dawkins can make significant inroads on the American religious scene. Recently, there has been an outpouring of books by prominent authors aggressively challenging the dominant role of religion in American life: Richard Dawkins, Sam Harris, Richard Joyce, Lee Silver,

Victor Stenger, and Christopher Hitchens.

Is change in the air?

Acknowledgments

I thank Laszlo Csonka, Jeff Lucas, and Sam Rosenfeld for extensive discussions and criticisms.

Notes

1. Theologian and philosopher, 1743–1805.

2. A reply, in English, by Einstein to a correspondent: "It was, of course, a lie what you read about my religious convictions, a lie which is being systematically repeated. I do not believe in a personal God and I have never denied this but have expressed it clearly."

3. Collins fights back (2006, pp. 27–28). His arguments, however, are fragmentary and criticism is dismissed casually.

4. He is the only current member of Congress to admit to being a nonbeliever. His House seat is said to be safe (*San Francisco Chronicle*, March 14, 2007).

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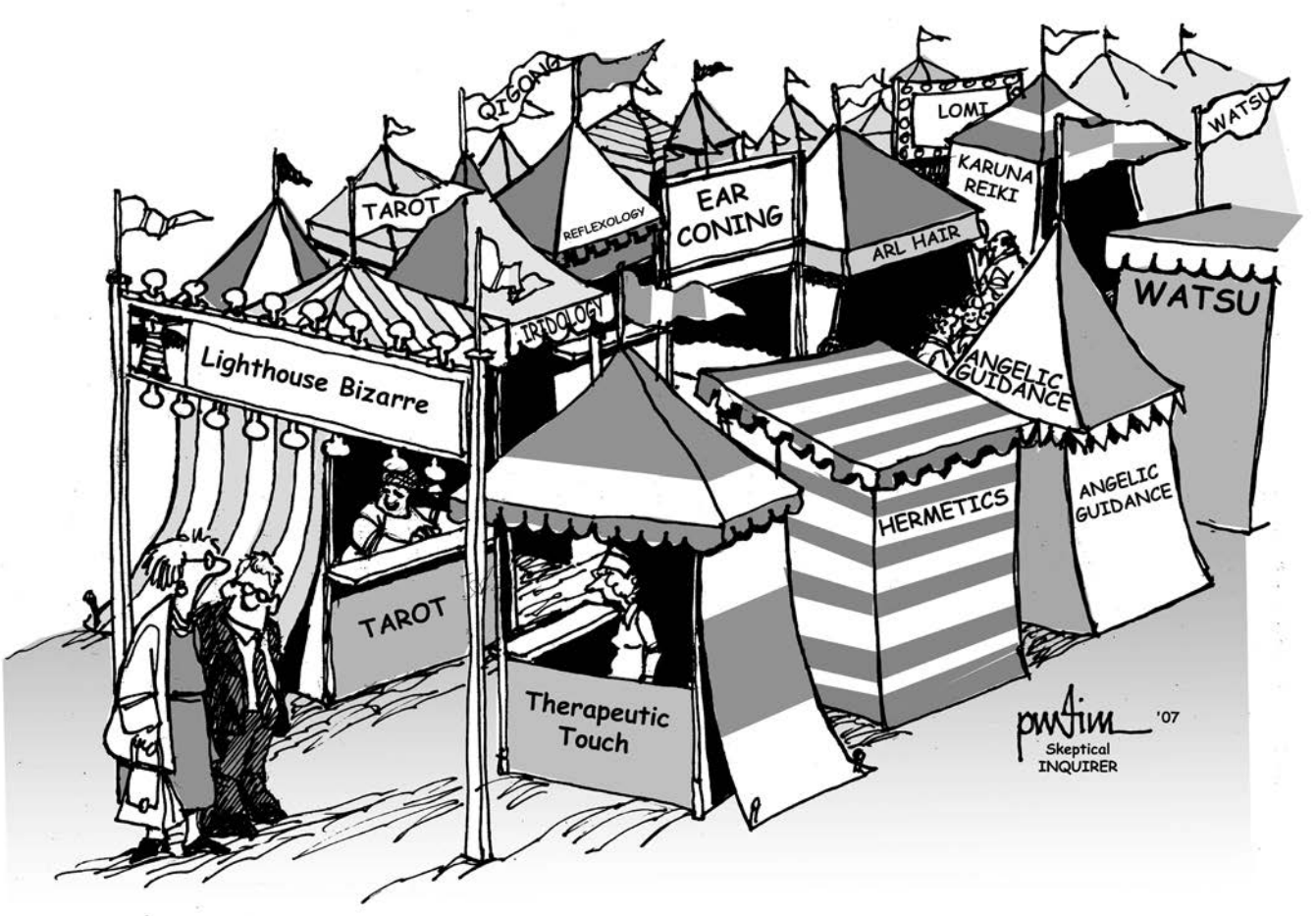
Stalking the Nutty Notions

There are more crackpot "spiritual," "medical," "therapeutic," and "healing" schemes out there than you can shake a talisman at. Just pick up one of the "alternative" publications and read the ads. It's snake-oil time in River City!

ROBERT L. WOLKE



I have stumbled upon a gold mine, a treasure trove, a skeptic's dream—or should I say nightmare? I have discovered a caché of well over a hundred of the nuttiest notions ever dreamed up by man and woman in order to fleece their fellow citizens. I feel like the cryptologist who has just cracked the enemy's code.

In my local public library, I came upon a give-away tabloid newspaper, whose banner read something like "Lighthouse: A Quarterly Chronicle of Meaningful Living." I don't want to give the correct name of the publication for fear that they will send evil spirits my way. After reading this piece, I'm sure they'd try. Okay, I'm really not afraid. The publication contained several feature stories on topics such as animal totems, feral cats, "energy psychology," and intelligent design, plus a Dear-Abby-ish "Practical Spiritual Advice" column.

But the real treasure was the ads, comprising perhaps 75 percent of the forty-six pages, bought and paid for by a veritable rogue's gallery of purveyors of the weird, from Acupuncture to Zen meditation, with bands of angels and flights of fairies thrown in here and there.

The publication contained several feature stories on topics such as animal totems, feral cats, "energy psychology," and intelligent design, plus a Dear-Abby-ish "Practical Spiritual Advice" column.

From this publication I have been able to compile three lists: a list of advertised services (which I alphabetized), a list of the promised benefits of those services (in no particular

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By Virtue of These Therapies, I Should Experience…

- The lengthening and repositioning of my fascial planes to where they anatomically belong.
- Being in touch with my totem animals.
- Freedom from undetected obstacles at my soul level.
- Being stronger in my connection to guides, angels, and the Creator.
- The ability to check on those who have passed.
- Being released from my personal blocks to abundance.
- Being energetically cleared.
- An increase in healing flow.
- The opening of my hands.
- The repatterning of my chakras.
- The rebalancing of my mind, body and spirit.
- A cleansing and regeneration.
- An enhancement of my stem cells.
- Enlightenment, good health, and peace.
- Increased energy and intelligence.
- A relaxed and creative life.
- Harmonious behavior and fulfilling relationships.
- Fulfilled desires and affluence.
- Communication with my guides and angels.
- An increase in my intuitive abilities.
- Understanding my intuitive receptors.
- The opening of my third eye.
- Channeling of messages from my guides.
- Receiving messages through angel writing.
- My spiritual empowerment.
- Exploring the relationship between self and the divine eternal.
- Rediscovering my own innate wisdom and ability to heal.
- Putting the miracle of energy medicine to work for me.
- The simple pleasure of living in my own body.
- Body awareness and a better sense of balance.
- Knowing how well I am eliminating waste and which of my organs are stressed.
- Greater self-awareness.
- A healed spirit.
- The clearing of my aura.
- Blasting through my blocks and fears, so I can move beyond them.
- Improved coordination and athletic performance.
- Balancing my whole body around a vertical line.
- A balanced life and body.
- Dissolving of the blocks within my body.
- Having my shakti boosted.
- Having my life force restored.
- Freedom from disturbances in my emotional structures.
- Working with my body's energy to overcome chronic health problems

. . . and a lighter wallet.

order), and a list of the various academic "degrees" claimed by the practitioners. Nothing confers the cloak of credibility on a crackpot like a bunch of letters following his or her name, even if we have no idea what the letters stand for—if anything.

I offer this information not in order to debunk it (that would require a long series of reincarnated lifetimes) but simply as a resource for my fellow skeptics, an anthology, if you will, of what we are up against. Scanning these lists, one can only marvel at the imagination and resourcefulness of those who are bent on making money by conning their fellows. Worse yet is the unsettling notion that many of these people may actually believe in what they are selling.

Read 'em and weep. □

Some of the Practitioner's 'Degrees'

ABMP	CSC	MA	MTIA	PharmD
AISI	DDS	MBA	NBCCH	RKRM
BSRN	DMQ	MD	NCC	RMT
CMT	LET	Mh.D	ND	RN
CNS	LPC	MSW	NMD	RPh
CRS	LSW	MT	Ph.D	SSRM

Some Services Offered by Advertisers

Acupuncture
Allopathic medicine
Angel cards
Angel readings
Angelic guidance
Anodyne therapy system
ARL hair analysis
Aromatherapy
Astrology
Aura and sound healings
Aura readings
Auric and chakra repair
Bead meditation
Behavioral medicine
Bioidentical hormone replacement therapy
Body work
Botanicals
Bowenwork
Brain wave technology
Buteyko breathing method
Candle flame
Chakra balancing
Channeling
Clairvoyance
Colon hydrotherapy
Color therapy
Cosmetic acupuncture
Cranial sacral therapy
Crystal ball reading
Crystals
Distance healing
Dowsing
Dream interpretation
Drumming
Ear candling
Ear coning
EMDR therapy
Energy healing
Energy medicine
Energy psychology
Energy rebalancing
Energy synchronization
Energy work
Esoteric astrology
Esoteric philosophy
Eye movement desensitization and reprocessing
Family constellation work
Feng shui
Flower essence consultation
Fusion therapy
Gentle yoga
Geriatric massage
Grief counseling
Group angel parties
Guided imagery
Harmonic wave machine
Healing stone massage
Healing touch
Health awareness laser therapy
Heartfelt yoga
Herbal food supplements
Herbal medicine
Herbs and supplements
Hermetics
Holistic dentistry
Holistic healing
Homeopathy
Homeopathic remedies
Hot rock massage
Hot stone massage
Hypnotherapy
Integral transformative practice
Interior alignment
Internal and external drainages
Intuitive self-healing
Ioncleanse detoxification
Ioncleanse footbath
Iridology
Jin shin jyutsu
Karuna reiki
Kinesiology
Kinesis structural integration
Laser therapy
Light and sound therapy
Light energization
Live blood cell analysis
Magnified healing
Lomi Lomi (I and II)
Lymphatic therapy
Mandala assessment
Past life readings
Phoenix rising yoga therapy
Prayer bead retreat
Prayers for wholeness and healing
Psychic readings
Psycho-spiritual processing
Qi healing
Qigong and Taiji
Qigong therapy
Reflective healing
Reflexology
Regression therapy
Reiki
Reiki attunements
Reiki drumming
Reiki healing
Resonation
Ro-hun therapy
Rolfing structural integration
Rubenfeld synergy method
Saliva hormone testing
Sclerology
Séance
Sekhem-seichim reiki
Soul coaching
Soul retrieval
Spiritual healing
Stem cell enhancers
Stone massage
Stress management
Structural integration
Synchro-alignment
Tarot
The bioenergy system
The nucca procedure
Therapeutic massage
Therapeutic touch
Thought field therapy
Topical pain management
Total body detoxification
Traditional Chinese medicine
Transcendental meditation
Trigger point therapy
Upledger lymph drainer
Usui method of natural healing
Vedic Vibration technology
Walking Meditation
Watsu
Zen Meditation

Creationism, Catastrophism, and Velikovsky

Catastrophism is a tenet of biblical fundamentalism (creationism). Immanuel Velikovsky (author of Worlds in Collision*) was a neocatastrophist. What use did creationism make of his theories?*

WILLIAM D. STANSFIELD

Catastrophism has long been an important tenet of creationism as an alternative theory to Darwinian gradualism (uniformitarianism). The theory of catastrophism was introduced by the French comparative anatomist and founder of the science of paleontology Georges Cuvier (1769–1832). He believed that each species originated independently and remained unchanged until it became extinct. He saw in the stratification of rocks, and the sequence of fossils therein, evidence of sudden geological changes and episodes of biological creations and extinctions caused by catastrophes such as massive volcanic outpourings, violent earthquakes, widespread flooding, and other natural processes. To biblical fundamentalists, catastrophism provided an explana-

tion for the prior existence of fossil species, the biblical flood, and other events that could be attributed to divine intervention. This made it possible to believe that all species (living and extinct) had been produced within the time indicated in the Bible since the creation of Earth and its inhabitants (Strickberger 1990).

Modern biological science accepts that some celestial catastrophes have greatly influenced the evolution of subsequent life forms (e.g., a mass extinction is thought to have resulted from an asteroid collision with Earth at the end of the Cretaceous period about sixty-five million years ago). This theory was first published one year after the death of Immanuel Velikovsky (1895–1979), whom some have suggested to be the father of modern catastrophism (neocatastrophism). His unorthodox theories, however, have been widely debated since the publication of his book *Worlds in Collision* in 1950. At least two generations of college students have grown up since then, but few today recognize his name, let alone know anything about the controversy he stirred up. His place in history continued to be reevaluated after his death in 1979 in many publications, including the SKEPTICAL INQUIRER and *Skeptic* (Bauer 1980; Frazier 1980; Oberg 1980; Bauer 1981; Gardner 1985; Ellenberger 1986; Bauer 1995; Cochrane 1995; Ellenberger 1995; Morrison 2001).

Meanwhile, on numerous occasions, biblical fundamentalists in the United States attempted to pass laws allowing or even requiring the teaching of "scientific creationism" in science classes of public schools. After several unsuccessful attempts to do so, creationist doctrines reappeared under the new banner of "intelligent design" (ID) theory. The latest legal defeat of the ID movement occurred in November 2005 when a federal court in Harrisburg, Pennsylvania, ruled that ID was just creationism in disguise (Humburg and Brayton 2006; Frazier 2006; Forrest 2007). After all, a rose by any other name is still a rose. Since catastrophism is still a basic tenet of creationism and ID as promulgated by the Institute for Creation Research (ICR), and several of Velikovsky's theories provide catastrophic explanations for some of the most important events in biblical history, I wondered if the creationists used any of his theories to support their literal interpretations of the Bible. Velikovsky could be found as recently as 1985 on ICR's Web site, and he still has many supporters (although not necessarily creationists) on the Velikovsky Web site (www.varchive.org). As a skeptic and evolutionary biologist (Stansfield 1977), I naturally wanted to know how creationists initially reacted to Velikovsky's book in 1950 and why they responded as they did thereafter. This article reports on aspects of the Velikovsky affair that most closely bear on my search for "some possible answers (but not necessarily the only ones) to these and related questions that we shall investigate" (paraphrased from the introduction to the television series *In Search Of*).

Worlds in Collision

Here are the principal hypotheses in *Worlds in Collision* (1950). The gods of many ancient cultures were represented in the sky by planets, comets, and stars. Greek authors such as Ptolemy and Homer described the birth of Athene (planet Venus) as having sprung from the head of Zeus (planet Jupiter). Thus, by a mechanism that Velikovsky did not explain, the planet Jupiter ejected protoplanet Venus as a comet (Morrison 1977). This comet passed close to Earth around 1500 B.C. and was directly or indirectly responsible for the plagues of Egypt described in the biblical book of *Exodus*. Material from the coma of this comet made the river Nile turn red; flies and scarabs fell from the comet onto earth; earthquakes destroyed Egyptian buildings. The sea parted, and the Children of Israel wandered for forty years in the wilderness. Manna rained down as carbohydrates from the comet's tail; Velikovsky proposed that hydrocarbons from Venus were converted to carbohydrates (manna) in Earth's atmosphere by "any of several well known reactions." The comet returned when Joshua commanded the Sun to stand still. It apparently did so for about a day; Velikovsky proposed that Earth stopped rotating (making the Sun appear to stand still) and then somehow returned to its normal rotational speed. The comet then nearly collided with Mars and knocked it out of its orbit, causing it to nearly collide with Earth on at least two subsequent occasions. As a consequence, Mars settled into its present orbit while the comet took a nearly circular orbit around the Sun and became the planet Venus. A second series of catastrophes occurred during the period 776–687 B.C. in the Near and Middle East where populations were decimated or annihilated, earthquakes occurred, the sea invaded the land, and the climate changed (Velikovsky 1955).

Manna rained down as carbohydrates from the comet's tail; Velikovsky proposed that hydrocarbons from Venus were converted to carbohydrates (manna) in Earth's atmosphere by "any of several well known reactions."

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The Noachian Deluge is mentioned in Velikovsky's *Stargazers and Gravediggers* (1983) where he claims "I did not discuss the Deluge [in previous books], much less try to prove its universality." Great floods are part of mythology in many cultures. However, geologists find no evidence for a worldwide flood in the geological record for at least the last ten thousand years. The ICR has a strange way of explaining the Great Deluge by a combination of supernatural and natural events. God miraculously caused a water vapor "canopy" in the upper atmosphere to condense into torrential rain and also caused the release of vast underground reservoirs of volcanically heated brines to cover Earth in a catastrophic worldwide flood. To end the flood, God also miraculously made the continents rise and the ocean basins sink along vertical faults. Between the initiation and termination miracles, "the Flood accomplished its work of destruction by purely natural processes. . . . Thus [creationist] Whitcomb . . . commits himself to explaining the bulk of geological evidence naturalistically" (Weber 1980).

Great floods are part of mythology in many cultures. However, geologists find no evidence for a worldwide flood in the geological record for at least the last ten thousand years.

Although Velikovsky did not explain how comet Venus was torn from planet Jupiter, creationists could have proposed that it occurred miraculously as part of the final stages of solar system formation, and then used the naturalistic affects of the comet on the biblical events that Velikovsky described. Why they failed to do so begs for an answer.

Velikovsky's Reception

Why did Velikovsky become so popular with the general public and remain so for such a long period of time? Carl Sagan opines that *Worlds in Collision*

> is an attempted validation of religion. The old Biblical stories are literally true. . . . Velikovsky also attempts to rescue not only religion, but also astrology: the outcomes of wars, the fates of whole peoples, are determined by the positions of the planets. . . . Some young people are put off by the occasional pomposity of scientists [and] may take some comfort in seeing scientists get their lumps. . . . To the extent that scientists have not given the reasoned response his work calls for, we have ourselves been responsible for the propagation of Velikovskian confusion. (Sagan 1977)

The attempt of some scientists to censor *Worlds in Collision* was viewed by some people as a cover-up by an elite group of insiders who feared open public discussion of revolutionary scientific ideas. Velikovsky could then be seen as a persecuted martyr (like a modern Galileo), but creationists did not avail themselves of this opportunity.

Leroy Ellenberger is a chemical engineer who was a confidant to Velikovsky for the last eighteen months of his life and served as the Executive Secretary and Senior Editor for the Velikovsky journal *Kronos* (1978–1986). Thereafter, he became a turncoat and one of Velikovsky's most persistent critics. In personal correspondence with Ellenberger, he told me that Velikovsky was a Zionist but apparently did not openly display his religiousness.

I also asked him about the creationists' reaction to Velikovsky following publication of *Worlds in Collision*. He replied:

> We [Velikovskians] did not spend any time at all pondering the creationists' reaction/attitude towards Velikovsky during the time I was an insider: 1977–1986, altho' we were aware of the many debunks/critiques by creationists, especially in CRSQ [*Creation Research Society Quarterly*]. . . . I recall taking consolation that at least the Velikovskians were NOT creationists (for the most part with Bob Bass being the major exception) and I know that Velikovsky had no sympathy for their cause despite the fact that he did quote at least one creationist flood book in *Earth in Upheaval* for data (which he could just as well have gotten from mainstream sources). It also bothered me even then that Lew Greenberg and others at *Kronos* relied on creationist critiques of radiometric dating, which I knew to be flawed even then.

My search of the Creation Research Society Web site produced abstracts from only four papers published in CRSQ containing references to Velikovsky, and only one of them helped answer my questions. An abstract of one paper says that Keister (1976) criticized Velikovsky for failing to provide a mechanism for disposing of tremendous orbital energies: "Some theological aspects of Velikovsky's theory are discussed and it is pointed out that whenever the theory and Scripture truly disagree, the theory obviously must be modified."

I also contacted ICR and received a response from Pierre D. Willems (2003), ICR Public Information Officer.

> *Has ICR ever taken an official position on the catastrophism theories of Velikovsky?*
>
> Nothing officially stated but neither has ICR written anything in support of his ideas.
>
> *How was his work received by various groups within the creationist community outside the ICR?*
>
> Some writers have mentioned his ideas but we are not aware of any following in support of Velikovsky's theories on celestial collisions.

The Discovery Society, a subsidiary of Discovery Institute's Center for Science and Culture, is dedicated to challenging Darwinian evolution and validating "the intelligent design of life and the universe." Searching its Web site via Google for "Velikovsky" resulted in only one hit that was of no help in my

research. Since three of the most prominent creationist organizations had so few citations for Velikovsky, I conclude that creationists have little if any interest in his theories, rather than being actively involved in debunking/critiquing them. But why?

Creationists seem to relish debates among scientists because they tend to view these squabbles as indicative of weak theories. For example, there are many questions about the details of evolution that have not been resolved, but that does not mean that the basic premises of evolution theory are on shaky ground or groundless altogether. The fact that Velikovsky's theories were rejected by most mainstream scientists might have been exploited by creationists as another example of science gone wrong. Siding with Velikovsky's critics on common scientific grounds might have given creationists the appearance of scientific respectability, which they so desperately wish to acquire by referring to themselves as "creation scientists."

The catastrophist theories presented in Velikovsky's 1955 book *Earth in Upheaval* were touted as offering a new understanding of evolution that conflicts with the gradualism in Darwin's theory, something one would think that creationists would have relished. In April 2002, I asked the National Center for Science Education (NCSE) why it has no information about him on its Web site, and received the following reply from Glenn Branch, Deputy Director of the NCSE. "Velikovsky's views, although as nutty as creationists', are generally passé and so not nearly as much as [*sic*] a threat to good science education, so NCSE doesn't focus its efforts on them—which is not to say that we're not interested in them. If, for example, someone published a new book defending Velikovsky, we would probably try to review it in RNCSE. You might look at www.talkorigins.org/origins/faqs-catastrophism.html and http://skepdic.com/velikov.html for some basic information about Velikovsky."

In 1991, the NCSE acquired *Creation/Evolution*, a magazine/journal formerly published by the American Humanist Association. An index was published for the first twenty-five issues of *C/E* (1980–1989). Only three articles are listed under "Velikovsky" in the index, none of which shed any light on the subject of my investigation, aside from that of Price (1980, first issue; the year after Velikovsky's death) discussed below. Unfortunately, the NCSE has published no index for its own *Reports*. This leaves me wondering about Velikovsky's influence on science education, especially during his numerous lectures on college campuses.

Why have creationists ignored or discarded Velikovsky's data and theories, when they seem to grasp at any other pseudoscientific straws that can be construed as supporting their cause? Are Velikovsky's views any "nuttier" than the flood geology of hydraulic engineer Henry Morris, who interpreted the fossil succession in the strata of the Grand Canyon as due to differential settling out from a worldwide flood within historical times? Morris, now dead, was among the founders of the Creation Research Society in 1963, and he served as president of the Institute for Creation Research from 1970 until 1995.

Although these kinds of interpretations have been thoroughly refuted in the scientific literature, the staff members of ICR continue to repeat their versions of Earth and biological history to anyone who will listen. It seems that if a lie is told often enough, a sizable segment of the general public will be gullible enough to believe it. Fundamental creationists count on this and the fervor of true believers in the inerrant Biblical record to make the facts of nature conform to their view. Velikovsky played the same game, continuing to present the same data and interpretations even after they had been thoroughly refuted by empirical scientific evidence or arguments based on well-established astronomical, geological, or biological principles.

Immanuel Velikovsky, photographed by Fima Noveck ca. 1974 http://en.wikipedia.org/wiki/Immanuel_Velikovsky

Velikovsky believed that all ancient manuscripts (such as the Bible), myths, legends, and folk tales present an accurate account of eye-witnessed history. As Robert Price (1980) noted, "First [Velikovsky] concludes that Mars once must have nearly collided with the earth; then he shuffles astronomy accordingly." In the same manner, [ICR resident faculty members] Gish and Morris discover in Genesis that the Earth is merely thousands of years old with a six-day period of creation; they then practice ventriloquism with the data of geology and biology. In both instances the dusty pages of ancient legend dictates in advance the results of scientific "research."

In this respect, Velikovsky's hypotheses go well beyond those of most creationists. It seems likely that creationists have ignored or discarded Velikovsky, at least in part, because they disapprove of his equating the legitimacy of ancient legends and myths of Earth and life histories on a par with the accuracy of the biblical accounts. ICR member Bert Johnson told me, "From what I understand, what distinguishes Velikovsky from most Creationists is his regard for ancient myths from all societies as being, like the Bible, more authoritative than scientific investigation. While it is interesting when myths [showing] great similarity to Biblical accounts are found throughout the world, we [ICR] believe that only the Biblical account is inerrent [*sic*] and should be trusted."

In the seventeenth century, Rev. Thomas Burnet authored the most popular geological treatise of the time—*The Sacred Theory of the Earth.* "Burnet's primary concern was to render Earth history not by miracles or divine caprice, but by natural physical processes. . . . John Keill, an Oxford mathematician, argued that Burnet's explanations were dangerous because they encouraged a belief that God is superfluous" (Gould 1977). In the preface [page vii] to *Earth in Upheaval*, Velikovsky writes, "I present here some pages from the book of *nature*. I have excluded from them all references to ancient literature, traditions, and folklore; and this I have done with intent, so that careless critics cannot decry the entire work as 'tales and legends.' Stones and bones are the only witnesses."

Thus, like Burnet, Velikovsky proposed that many *natural* catastrophes have plagued our globe in both prehistoric and historic times. It seems likely that biblical creationists reject Velikovsky's theories in part because they want to believe that these catastrophes were mediated by the hand of God as miracles rather than due to natural processes. Furthermore, Velikovsky had no natural explanation for the greatest catastrophe in the Bible—the Noachian flood. Creationists could have claimed that, since Velikovsky had no natural explanation for the flood, it must have had a supernatural cause. Why they did not do this remains a mystery.

I queried AnswersinGenesis.org: "I'm curious as to why there is so little information available about Immanuel Velikovsky and his theories about catastrophes in recent (especially biblical) times. Do you have any publications that discuss his contributions?" They replied, "Don DeYoung's *Astronomy and the Bible* has some brief but helpful information on V's ideas and their acceptance or non-acceptance by creationists." So I ordered a copy (I reviewed it in the March/April 2007 SI) and found the following information on the last page: "Don DeYoung holds a Ph.D. in physics from Iowa State University and a Master of Divinity from Grace Seminary. . . . He firmly holds to the literal creation view of origins." De Young, a resident faculty member of ICR, wrote:

> Velikovsky's ideas are a mixture of truth and error. His proposal of a recent Ice Age is shared with creationists, as are his challenges to "the doctrine of uniformity" (that rates of formation and erosion have always been constant). However, Velikovsky is hardly a friend of creationists or Christians in general since he fully accepted evolutionary theory. Velikovsky denied the Genesis flood and attempted to explain away the Old Testament miracles as natural catastrophes. . . . Although his writings are valuable for study, he was certainly as fallible in his thinking as anyone. (DeYoung 2000, p. 52)

If DeYoung's views generally reflect that of the majority of his fellow creationists, I believe that this explains the primary reasons they have ignored or rejected Velikovsky's theories.

The Velikovsky story remains relevant for us today for at least two reasons. First, it is important to realize that for many years, Velikovsky's pseudoscientific theories diverted the efforts of many scientists away from productive research in order to provide scientific arguments (based on empirical evidence and well-established principles of physics) in the popular press against them. Second, the Velikovsky story serves as one of the most striking case histories in modern times of the struggles scientists must sometimes make to combat pseudoscientific ideas that have managed to grab the attention and allegiance of a significant proportion of the general public. "The furor over [Velikovsky's books], and over the slightly later works of best selling authors such as Erich von Däniken, helped launch the modern skeptical movement" (Frazier 2005).

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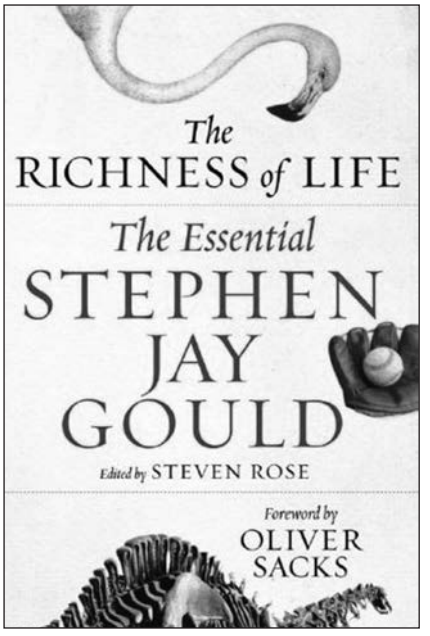
Unrivaled Acumen, Communitarian Passion

KENNETH W. KRAUSE

The Richness of Life: The Essential Stephen Jay Gould. Edited by Steven Rose.
W.W. Norton and Co., New York, 2007. ISBN: 978-0-393-06498-8. 654 pp. Hardcover, $35.

If the course of evolution were commanded by a superior intelligence or according to some species-centered notion of progress, humans might reasonably expect to be surrounded by the likes of Stephen Jay Gould. Before his death in 2002, Gould was a prolific and award-winning author, a distinguished member of the National Academy of Sciences, and Harvard professor of zoology and geology for more than thirty years. But informed laypersons know better than to take such brilliance for granted, thanks in large measure to Gould himself as seen in the new book *The Richness of Life: The Essential Stephen Jay Gould.*

After three billion years of unicellular ascendancy, then a mere five million years of Cambrian creativity, Gould argued, the last 500 million years of "variation on set anatomical themes can scarcely be read as a predictable, inexorable, or continuous trend toward progress or increasing complexity" (Rose 217). Natural selection, in fact, has never favored intricacy. Rugged, diverse, and highly adaptable, bacteria have long been and probably will always be the most successful life form on Earth. And what could be more random—more lucky or unlucky depending on



your perspective—than death by mass extinction? Consider the fates of the diatoms (eukaryotic algae) and small, rat-sized mammals that lived 65 million years ago, just prior to the notorious asteroid impact off the Yucatan peninsula. Diatoms didn't survive because they were loved from above or because of their advanced biology. These single-celled players hit the Cretaceous lottery only because they had previously evolved a seasonal dormancy strategy. Nor were mammals in any way superior to the dinosaurs with which they had coexisted for 100 million years. Only their diminutive stature allowed them to persist and us to subsequently evolve. Complexity, intelligence, and consciousness, in other words, were begat by nothing more progressive or divine than dumb luck.

But Gould was celebrated as well for his gritty confrontations with fellow intellectuals—zoologist Richard Dawkins and philosopher Daniel Dennett—most conspicuously. He pejoratively referred to them as "Darwinian fundamentalists" or "ultra-Darwinists" because of their supposed insistence upon interpreting every organismal attribute as an adaptation for reproductive success. Their "adaptionist program" dogmatically assumes natural selection to the exclusion of all other evolutionary mechanisms.

With Dawkins, Gould took issue on two fronts. First, the idea that organisms amounted to little more than passive vessels puppeted by genes struggling for reproductive advantage represents the pinnacle of adaptionism. The "selfish gene" theory, Gould scolded, was "a logically flawed and basically foolish caricature of Darwin's genuinely radical intent" (446). Second, and perhaps more thoughtfully, Gould rejected the claim that "memes," or professed cultural units consisting of thoughts or behaviors, could evolve at all in Darwinian terms. Biological forms, after all, are drastically more confined than cultures. A platypus, for example, cannot incorporate rat genes to generate a "ratty-pus" lineage, because evolution can operate only on preexisting raw materials. Ideas and behaviors, however, can diverge in an essentially Lamarckian mode, borrowing from or incorporating potentially infinite others at any time. Religions, for instance, can

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and frequently do interconnect with, hijack, or simply sponge from independent creeds to form mythological hybrids (though perhaps, as with Christian churches, only to deny it later). As such, Gould chided, "cultural change will receive only limited (and metaphorical) illumination from Darwinism" (464).

Gould's criticisms of Dennett stemmed, for the most part, from the latter's 1995 attacks against Gould's pluralist ideas. Dennett, apparently, had denied the dominance of punctuated equilibrium (a theory introduced by Gould and Niles Eldredge in 1972 proposing that evolution proceeds in extended periods of relative stasis punctuated by brief intervals of rapid change) over gradualism (the traditional Darwinian expectation that significant and directional modification occurs very slowly through geological time) in the creation of new species. But only the theory of punctuated equilibrium, Gould argued, could predict exactly what we have found (and not found) in the fossil record—evidence of overwhelming changelessness and sudden morphological macroevolution among small and geographically peripheral populations. Gradualism, by contrast, simply cannot account for the archeological facts. So, too, had Dennett maligned the importance of "spandrels," structural yet nonadaptive by-products of evolutionary change, as fodder for later adaptive reuse or exaptation. Because organisms are profusely complex and integrated creatures, Gould explained, adaptive change always casts off material side consequences akin to architectural spandrels, or the triangular spaces left over between a rounded arch and its surrounding rectangular frame and ceiling. Consider reading and writing, for example. Each must have originated as a nonadaptive spandrel, since the human brain achieved its present size and structure tens of thousands of years prior to literacy. "Taken together," Gould concludes, "punctuated equilibrium and spandrels invoke the operation of several important principles in addition (and sometimes opposed) to conventional natural selection" (456).

Arguably, Gould was significantly more patient with religious dogmatism. Gould's now well-worn doctrine of discrete teaching authorities, or "non-overlapping magisteria," proposed that, because science probes only the empirical realm and religion only moral and spiritual issues, the two should never contradict, let alone come to blows, with one another. Indeed, Gould offered Pope John Paul II's 1996 recognition of evolution as confirmation that there can and should exist a "respectful, even loving, concordant between science and religion," as if the European Church could possibly have continued to deny the unassailable evidence of evolution without sacrificing all remaining credibility.

Even so, Gould never shrank from creationist challenges either, no matter how misguided or obnoxious. Nor did he take them personally. A consummate scientist, Gould simply seized upon these challenges as opportunities to educate the educable, if not the creationists themselves. Prior to 1994, for example—and still today, no doubt, among ever-inveterate and proudly uninformed young-Earthers—religious demagogues regularly mocked Darwin's generally prescient suggestion that whales probably evolved from bear-like land mammals. A few such detractors even managed to ask the helpful and appropriate question—*Where are the transitional fossils?*—to which Gould and others politely and decisively responded as evidence became available.

In 1983, Phil Gingerich and colleagues unearthed the skull of *Pakicetus* from Middle Eocene sediments some 52 million years old in modern-day Pakistan. Although considered the oldest whale, *Pakicetus* retained certain features in its teeth and auditory structures that appeared to identify it as an ancestor of the mesonychids, carnivorous runners that fed on fish at rivers' edges (others suggest that whales are more closely related to artiodactyls). Seven years later, Gingerich found hundreds of partial skeletons, including a complete hind limb belonging to *Basilosaurus isis*, an ancient whale that inhabited Egypt five or ten million years after *Pakicetus*. Judging by their diminutive leg size, these creatures had already made the transition from land to sea. Thus, although an important discovery, *Basilosaurus* could not serve as a true intermediate. In 1993, however, the hind limbs of *Indocetus ramani*, another early whale that lived between the eras of *Pakicetus* and *Basilosaurus*, were located in India and Pakistan. Clearly amphibious, *Indocetus* could still support itself on the land to which it likely returned to birth and raise its offspring.

Gould's "smoking gun," however, arrived in 1994. Slightly younger than *Pakicetus*, *Ambulocetus natans* revealed a truly intermediary method of locomotion. Its feet and hind legs were large and robust, and each of its toes culminated in a tiny hoof, much as those of its suspected mesonychid ancestors did. Its forelimbs, by contrast, were much smaller and may have served mainly for stability—as with modern sea lions. But the shape of its lumbar vertebrae enabled *Ambulocetus* to swim in a characteristically cetacean-like manner—by dorsoventral (back-to-belly, as opposed to side-to-side like a fish) undulation. Such motion, Gould noted, is also common among today's fast and agile carnivores, and probably among their ancient counterparts. Last, but not least, Gingerich and company published their description of *Rodhecetus karsani*, another specimen from Pakistan and perhaps the oldest deep-water whale. Just a few million years younger than *Ambulocetus*, but substantially older than later whales fully committed to the sea, *Rodhecetus* bore a shorter hind limb and, like modern whales, unfused sacral vertebrae.

Together, these fossils demonstrate an unmistakable diversity among ancient whales. For Gould, who gushed profusely over every satisfying detail, they also represented the triumph of honest yet popular science over obstinate creationist ideology. We'll miss his enthusiasm no less than his expertise.

As the title implies, *The Richness of Life* is both varied and penetrating. At one point, Gould stretches well beyond the lay reader's intellectual grasp. But better his unrivaled acumen should occasionally leave us dry than his communitarian passion condescend to our weak-

ness for baseless simplicity. Science has never dispatched a more fluid or informed writer or one with a deeper sense of social responsibility. Who better than Gould, then, to relay the most exquisite, dreadful, gripping—and most relevant—drama of all time?

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Born to Believe

DAVID LUDDEN

Six Impossible Things Before Breakfast: The Evolutionary Origins of Belief. By Lewis Wolpert. W.W. Norton, New York, 2006. ISBN: 978-0-393-06449-0. 243 pp. Hardcover $29.95.

In the children's classic *Through the Looking Glass* by Lewis Carroll (1871), Alice protests that she can't believe impossible things. In response, the White Queen insists that it is merely a matter of practice, adding, "Why, sometimes I've believed as many as six impossible things before breakfast." In biologist Lewis Wolpert's new book *Six Impossible Things Before Breakfast*, he argues that not only is it quite easy to believe impossible things, we are in fact biologically driven to do so.

Wolpert views beliefs as causal explanations, and he argues that there is a strong biological bias in humans to seek causes for events in their lives. No other species makes causal inferences, Wolpert argues, but this ability clearly gave humans a strong evolutionary advantage, allowing them to understand—and hence control—their environments to a far greater degree than any other animal. Still, our ability to ascertain causality is not that reliable. For one thing, we are prone to causal illusions—we infer causal relationships where none exist. Furthermore, when we are unable to explain why events occur, we feel distressed, so we tend to make up explanations with little or no evidence to support them. Nevertheless, the advantages of this ability to construct beliefs about causal relationships must have outweighed the negative side effects for early humans.

Wolpert's central thesis is that belief arose as a product of tool use among our early ancestors. Wolpert reasons this way: beliefs are products of the brain, and the brain controls movement. In essence, beliefs are expectations about the outcomes of movements based on memories of past movements. Wolpert sees a feedback loop between tool use and causal inference. Repeated use of simple tools helped humans develop a rudimentary understanding of causal relationships, and as humans became more adept at thinking through the outcomes of movements, they were able to build more sophisticated tools that went beyond mere amplification of body part motions. Infants today repeat these steps as they learn about causality by interacting with their environments. What is learned in this way is a sort of folk physics that strictly speaking not correct but provides a reasonably good framework for gaining control over the environment.

Over eons, Wolpert maintains, particular biases toward belief formation have been hardwired into the brain. To support his hypothesis that beliefs arose from tool use, he points out that there are particular areas of the brain associated with it. Damage to these areas leads to a condition known as "apraxia": inappropriate tool use, such as brushing your teeth with a comb. In addition, damage to these areas of the brain also leads to deficits in causal thinking. This indicates that the same areas of the brain that support tool use also support the production of inferences about causal relationships, just as we would expect if tool use and causal inference arose in tandem.

Wolpert argues that constructing and maintaining causal beliefs is a strictly human ability. Nonhuman animals, he claims, can learn correlations through associative learning. For instance, a rat can learn that pressing a lever produces food. However, causal thinking requires an understanding of mechanism, some "intuitive concept of force" (p. 53). According to Wolpert, nonhuman animals lack such a concept, and so they lack the ability to form causal beliefs. Only primates show some evidence of a nascent concept of cause, in that they do use whatever is handy as a simple tool, indicating that they have some causal expectation. But they do not fashion tools from scratch, suggesting a lack of strong causal understanding.

In this view, language would have developed in conjunction with tool production and use. Making and using complex tools cannot be learned through imitation alone, Wolpert maintains, so some sort of instruction was required. There are parallels between tool and language use—both involve fine-motor movements, precise timing, and sequencing of actions. In addition, much of the content of language—who did what to whom—involves causal relationships. So, causal thinking was a precursor to language, but once language had developed, it supported even more complex thinking about causality. Language, then, gave humans the ability to extend causal thinking beyond tool use to all other realms of human experience,

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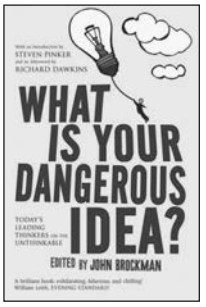
even death.

Built on a foundation of tool use for the purpose of considering and expressing causal beliefs, language would have led naturally to the development of religion. Once humans had the ability to think in a complex fashion about causal relationships, it was only natural that they would start pondering the big questions of life and death. Religion provides reassuring answers to those questions. In Wolpert's view, religious beliefs were adaptive because they provided their believers with coping strategies in an uncertain world. Likewise today, religious and paranormal beliefs can provide a sense of control to those who hold them. However, Wolpert argues that continuing to maintain religious beliefs in a scientific society is counterproductive, because science and religion provide conflicting causal explanations of events in the world.

Wolpert's idea that beliefs arose from tool use is unusual but intriguing. It is more generally assumed that language and belief formation arose through the complex social interactions of early humans. To get along with others, we need to be able to communicate our intentions and predict the effects of our interactions with them. Language and causal thinking would facilitate this. But Wolpert argues that language involves a sense of self as agent that would more readily arise from complex tool use, which would involve simpler scenarios and more predictable outcomes. Once a sense of self-agency had arisen through tool use, it could be applied to social situations. Wolpert's idea has merit; after all, chimpanzees maintain complex social relationships, but they do not have language, nor do they make or use complex tools.

Six Impossible Things Before Breakfast is an intriguing and thought-provoking book. Wolpert's case is not solid, and he will not convince all of his readers. But he does provide enough tantalizing evidence in support of his hypothesis that it cannot simply be dismissed. The book is an important contribution to the literature on the psychology of belief, providing the reader with plenty to think about—if not necessarily to believe.



Dangerous Ideas on the Loose

KENNETH W. KRAUSE

What Is Your Dangerous Idea? Today's Leading Thinkers on the Unthinkable. Edited by John Brockman. HarperCollins, New York, 2007. ISBN: 978-0-06-121495-0. 301 pp. Softcover, $13.95.

Who doesn't love a dangerous idea? A rousing, radical suggestion can ignite a revolution or, at the very least, intrigue, titillate, or entertain. We all adore dangerous ideas—except, that is, the ones that threaten something *we* hold sacred. In that case, thoughts become taboos, and those hostile to them become prudes and, on occasion, potentially savage tyrants.

A latent Torquemada lurks in each of us, notes Harvard cognitive scientist Steven Pinker in his darkly candid introduction to John Brockman's most recent collection of more than one hundred breviloquent essays, *What Is Your Dangerous Idea?* While the theme of this year's anthology (a compilation of responses to the annual "dangerous idea" question, which first appeared on the Edge.org Web site) is more constrained, its stable of contributors is perhaps more diverse—culled from the realms of politics, economics, ethics, and a wide variety of both hard and soft sciences. The more fateful the issue, the better. But beware—when pet positions clash, even allegedly rational minds will erupt into seething volcanoes of injunction, intolerance, and zealotry.

And what could be more incendiary than the prospects of human cloning and designer babies? Easy, Pinker answers: try persistent inquiry into the allegedly genetically predetermined talents and temperaments of women, blacks, and Jews. In January 2005, Harvard president Lawrence Summers cited research suggesting that men and women might have different mental abilities and life priorities. *The New York Times* later reported a forthcoming study proposing that Ashkenazi Jews have been naturally selected for elevated intelligence and, as an unfortunate by-product, certain genetic diseases. In September, political scientist Charles Murray renewed his argument that average racial aptitude variances are in part genetically controlled.

Sadly—though predictably—academic reactions were nothing short of vitriolic. "Large swaths of the intellectual landscape," Pinker observes, "have been reengineered to try to rule out these hypotheses a priori" (14). The forgivable assumption, of course, is that majorities (or disproportionately empowered minorities) will misinterpret the data and apply them immorally. But a careful evaluation of these studies reveals only the average or variance of a statistical distribution and not the cast of any particular individual's character or predilections. To what extent should we trust in our liberal political and intellectual ideals? Should the search for truth ever be sacrificed to fear?

A prolific and powerful drug industry has much to fear from studies indicating the negative sway of Prozac and other serotonin-enhancing antidepressants on romantic love, argues Rutgers research anthropologist Helen Fisher in another essay. Smothering dopaminergic pathways in the brain, these increas-

ingly popular—in some circles, fashionable—psychotropics muzzle emotional obsession and, as a result, interpersonal attachment. Seventy-three percent of users report struggles in achieving sexual arousal or orgasm. Worse yet, serotonin stimulates the release of prolactin, which in turn impairs fertility by suppressing the emancipation of other hormones. As generic serotonin reuptake inhibitors become widely available, Fisher warns, not just individuals and families but the entire human species will eventually be affected, and along with it critical social and political policies and global moral paradigms. In the long run, maybe numb isn't necessarily better. Then again, could we really get any more numb?

Perhaps so, some might argue, if people generally come to disbelieve in souls. If the materialist assumptions of modern neurobiology are accurate, wonders Yale psychologist Paul Bloom, why should even the most reprehensible criminals—murderers, rapists, and pedophiles—ever be held responsible for their actions? If behavior is predetermined, deterrence is irrelevant and punishment amounts to little more than institutional cruelty. If the distinction between humans and other animals is only a matter of degree and not of kind, maybe the former deserve no special respect, no defense from barbarism, enslavement, or even cannibalism. Not so, Bloom concludes. Humans are indeed unique, so long as they remain the only species capable of complex abstraction and emotion.

But when Francis Crick and James Watson revealed the genetic code's double helix structure in 1953, they initiated a philosophical as well as a scientific revolution, argues science journalist John Horgan. Today's neuroscientists have also begun to unravel the so-called "neural code," an intricate program that converts electrochemical impulses into perceptions, memories, emotions, and all of the other elements of human consciousness—thus reducing the soul to an ever-diminishing ghost of the gaps. Mastery of our psychological future, Horgan posits, may hang in the balance. At some point, in fact, we might decide to affirmatively program faith in an imaginary soul into the recesses of our collective psyche.

Also in 1953, a graduate student named Stanley Miller demonstrated that an electric spark could transform a mixture of simple gases into small organic molecules, or monomers, single-handedly rekindling scientific interest in the origin of life. Since then, researchers have focused their attention on more complex polymers, including DNA (which stores genetic information), proteins (which allow DNA to reproduce), and RNA (which manages both heredity and catalysis). In 1986, in fact, Walter Gilbert proposed that life began when RNA copied itself in a pool of its own constituents.

Most dangerous of all, perhaps, are those who judge themselves supremely enlightened, denying the foreboding and forbidden iniquities of their shared humanity.

Chemist Robert Shapiro's dangerous idea, however, is that, although large molecules govern life's processes today, neither DNA, proteins, nor RNA were essential billions of years ago to the commencement of life on Earth (or elsewhere). An appropriate mixture of monomers, he insists, can support both heredity and catalysis when zapped with the right energy source. Providing the research community sufficient time to abandon the polymer-based paradigm, Shapiro guesses that we will make this discovery in about five years. To whom is this idea most dangerous? Increasingly desperate creationists, no doubt, who rely on the present incompleteness of RNA theories to crutch their claims to the supernatural origin of life.

"Puritans" of a different, environmental ilk might feel threatened by physicist Paul C.W. Davies's conclusion that global warming "may turn out to be not so bad after all" (p. 44). *Nature* editor Oliver Morton appears to concur. Compared to past environmental catastrophes, especially those that resulted in mass extinctions, Morton argues, "the current carbon/climate crisis seems pretty small beer" (pp. 50–51). This is not to imply the absence of a significant challenge, at least for certain species, including humans. But when environmentalists employ extreme eschatological rhetoric, writes Morton, they succeed primarily in providing an easy target for those who would benefit from both popular resignation and political inaction.

Disparaging the Kyoto accords as economically unviable, physicist Gregory Banford tenders two practical solutions. First, we could dump our carbon-rich agricultural wastes (leftover corncobs and stalks, for example) into the ocean—beneath the thermocline at a depth of about a kilometer—where it would remain completely submerged for at least one thousand years. Second, we could reflect excess sunlight and heat by artificially adjusting cloud cover over tropical oceans. But environmental puritans, Banford expects, will condemn such proposals—despite their earthy sensibility—simply because they entail limited self-castigation and individual sacrifice.

Collectively, *What Is Your Dangerous Idea?* is an equal-opportunity gadfly, promising on any given page to validate or offend, depending on your prejudices and affiliations. "People have a nasty habit of clustering in coalitions," Pinker observes, "professing certain beliefs as badges of their commitment to the coalition and treating rival coalitions as intellectually unfit and morally depraved" (p. xxvii). Most dangerous of all, perhaps, are those who judge themselves supremely enlightened, denying the foreboding and forbidden iniquities of their shared humanity. Suppression born of self-righteous indignation, in other words, is at least as treacherous as that instigated by stark, unpretentious

Listing does not preclude future review.

WHO MOVED MY SECRET?: The Ancient Wisdom That Tells You It's Okay To Be Greedy. Jim Gerard. Nation Books, New York, New York, 2007. 118 pp. Softcover, $9.99. Rhonda Byrne's New Age self-help book *The Secret* has remained comfortably on America's best-seller lists for much of the past year. Though its premise has been thoroughly debunked in SKEPTICAL INQUIRER ("Secrets and Lies," May/June 2007) and other publications, it seems that readers can't get enough ill-informed, patently ridiculous, superficial blather promising them that the world will be theirs if they just think positive thoughts. Elvis Costello had some words of wisdom for exasperated skeptics: "I used to be disgusted, now I try to be amused." In this vein, satirist Jim Gerard (author of the end-times guide for heathens *Beam Me Up, Jesus!*) issues forth a sharp parody of *The Secret*. Gerard is dead-on with his send-up of simplistic, fuzzy-thinking, slickly-marketed New Age books. *The Secret* is ripe for satire, a textbook example of a mish-mash of dubious "experts," fuzzy thinking, a smattering of pseudoscience, and self-contradictory premises. Though most of Byrne's readers probably won't notice them, Gerard exposes these and more with a skeptical but seriously funny wit. Gerard shows his familiarity with the books he skewers even in his deadly-accurate chapter titles such as "Chapter 5: Same Shit as in the First Four Chapters" and the last chapter, "Chapter 11: More Filler." Who says skeptics don't have a sense of humor?—*BR*

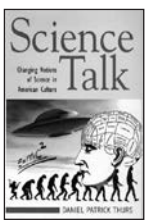
ADVENTURES IN PARANORMAL INVESTIGATIONS. Joe Nickell. University Press of Kentucky, Lexington, Kentucky, 2007. 320 pp. Hardcover, $29.95. Joe Nickell, the Committee for Skeptical Inquiry's intrepid and indefatigable Senior Research Fellow, is at it again with a new collection of his investigations culled from four decades of research. Does the ghost town of Bodie, California, curse visitors who take away its artifacts? Can faith healer Peter Popoff really cure people with the power of God? And just what was that mysterious, decaying alien hand found in Wyoming County, New York? Nickell tackles these cases and over a dozen others (including phantom hitchhikers, stigmata, crop circles, haunted houses, psychic detectives, and miraculous relics). Many of the chapters are adapted from Nickell's long-running SKEPTICAL INQUIRER column, Investigative Files. Whether going undercover to ferret out the truth behind a charlatan or using forensic scientific analyses on alien body parts, Nickell's cases are always well-informed by meticulous scholarship—as well as a fun read.—*BR*

EVOLUTION: A Historical Perspective. Bryson Brown. Greenwood Press, Westport, Connecticut. 2007. 195 pp. Hardcover, $65. The latest of "Greenwood Guides to Great Ideas in Science," a series devoted to concepts fundamental to different branches of the natural sciences. The author (professor of philosophy, University of Lethbridge) provides a clear, succinct guide to evolution. He points out that evolution is one of the great scientific ideas, and both Darwin's ideas and the modern evolutionary synthesis can, unlike much of modern physics, be understood with nothing more than common sense and a little thought. He begins by confronting the problem of overcoming many students' "radical skepticism" and the wrongheaded idea that we can't really know anything about the past, which is a common barrier to understanding. He examines creationism in this context and then proceeds with eight clearly written chapters: Life's History, The Tree of Life, Darwin and the Beagle, One Long Argument, Heredity and Natural Selection, Biochemistry, DNA, and the Future of Biology, Abiogenesis, and Our Place in the Natural World.—*KF*

THE JINN FROM HYPERSPACE and Other Scribblings—Both Serious and Whimsical. Martin Gardner. Prometheus Books, Amherst, New York, 2007. 270 pp. Hardcover, $25.95. The irrepressible polymath Martin Gardner comes up with another lively compilation of recent essays and reviews. It's the most recent of a series of delightful, witty, informative books Gardner has been publishing for over fifty years now.

This one's divided into four sections: Science, Math, and Baloney; Literature; L. Frank Baum; and Lewis Carroll. The title essay is about a jinn (genie) trapped in a "Klein Bottle," a theoretical one-sided object. The lead two chapters consist of Gardner's two articles on the False Memory Wars which were published by the SKEPTICAL INQUIRER in 2006; another is his SI article "Energy from the Vacuum?" (January/February 2007). He also writes on such topics as time-reversed worlds, transcendental numbers, a defense of Platonic realism, "Professor Cracker's Antitelephone," and Blabbages's decision paradox. He asks, "Is Beauty Truth?" "Is String Theory in Trouble?" and "Do Loops Explain Consciousness?" (the last, a review of Douglass Hofstadter's new book). On the literary side, he discusses two neglected works by G.K. Chesterton, one concerning an imaginary but now very topical war between Islam and Christianity. He also considers the fantasies of L. Frank Baum that don't take place in Oz and books by Lewis Carroll that have been overshadowed by his famous *Alice in Wonderland*. Each chapter has a lively new introduction by Gardner. A typical potpourri of Gardnerian intellectual delight.—*KF*

COOL IT: The Skeptical Environmentalist's Guide to Global Warming. Bjorn Lomborg. Knopf, New York, 2007. 253 pp. Hardcover, $21. Lomborg (Copenhagen Business School and author of *The Skeptical Environmentalist*) here attempts to transform the debate about global warming with a fresh perspective based on human needs as well as environmental concerns. He states clearly at the outset "That humanity has caused a substantial rise in atmospheric carbon-dioxide levels over the past centuries, thereby contributing to global warming, is beyond debate." But what is debatable, he says, is "whether hysterical and headlong spending on extravagant CO_2-cutting programs at an unprecedented price is the only possible response." He asks that we cool the rhetoric and have a measured discussion about the best ways forward. "We clearly need better ways to deal with climate change," he says. He provides an economist's analysis of not only much of the scientific data about climate change but also many of the proposals for mitigating it.—*KF*



SCIENCE TALK: Changing Notions of Science in American Culture. Daniel Patrick Thurs. Rutgers University Press, New Brunswick, New Jersey. 2007. Hardcover, $44.95. The public's paradoxical mixture of fascination and disengagement with science is one of the recurring themes of this work, which considers how the advances of science—and the debates they engender—contribute to changing definitions of science itself. Thurs approaches the role of science in popular culture from a history-of-science perspective, drawing on analysis of magazines, newspapers, journals, and other forms of public discourse. He follows the history through high-profile public debates over the scientific status of five ideas, each composing a chapter: Phrenology: A Science for Everyone, Evolution: Struggling Over Science, Relativity: A Science Set Apart, UFOs: In the Shadow of Science, and Intelligent Design: The Evolution of Science Talk.—*KF*

WONDERFUL WORLD OF SPACE. Andrew Fraknoi. Disney Learning/ Disney Press, New York. 2007. 125 pp. Hardcover, $12.99. How hot is the Sun? Do black holes really exist? Is there life on other planets? This book, produced by the Disney organization, is designed to help your child answer these and many other questions. With succinct text written by astronomer, award-winning science-popularizer, and CSI Fellow Andrew Fraknoi and with several hundred color photos and other illustrations (including Disney/Pixar cartoon characters' frequent appearances), this is a nicely written, attractively formatted book for young readers. Divided into five chapters: Planets & Moons, Stars, The Universe & Its Galaxies, Exploration and Discovery, and Everyday Astronomy.—*KF*

—Kendrick Frazier and Benjamin Radford

One Large Defeat for Science in Canada

GARY BAUSLAUGH

While the News and Comment item by Bruce Pendergast in the September/October 2007 SKEPTICAL INQUIRER titled "One Small Victory in Canada in Support of Evolution" was well-intentioned, I am afraid that it is somewhat misleading. Pendergast appears to have only a small part of the story regarding an evolution and intelligent design controversy in Canada, and he misread some recent information he received.

A year ago last spring, Canada's second-largest research-granting agency, the Social Sciences and Humanities Research Council (SSHRC), which dispenses around $300 million a year for research projects, clumsily initiated a major controversy about evolution and intelligent design in Canada. The problem centered on the rejection of an application by Brian Alters of McGill University. Alters is one of the world's foremost authorities on evolution, particularly as it relates to education—he appeared as an expert witness in the recent landmark Dover, Pennsylvania, trial. He proposed to study "the detrimental effects of popularizing anti-evolution's intelligent design theory on Canadian students, teachers, parents, administrators and policymakers."

The rejection in itself was not the problem. Only relatively few projects submitted to SSHRC are approved, and even one from the likes of Alters could be rejected for any number of reasons. The rejection alone would not have created even a ripple. For some reason, however, the adjudication committee that reviewed Alters's application could not resist, in its statement of rejection, adding the following gratuitous comment:

> Nor did the committee consider that there was adequate justification for the assumption in the proposal that the theory of Evolution, and not Intelligent Design Theory, was correct. . . .

This is the statement that caused concern among scientists around the world. Was SSHRC buying the creationist ploy of intelligent design, a shallow and obvious strategy to bring religion into the science classroom? Do people at SSHRC really think that the religious idea of intelligent design is just as valid as evolution?

Sometime last year, in a response to the controversy, the SSHRC Web site posted an announcement saying that it did recognize that evolution was a "cornerstone of science." That was the statement Pendergast recently heard about and construed as a concession, but it was not, and it in fact (deliberately, many of us suspect) obscured the real issue. Of course evolution is a cornerstone of

Was the [Social Sciences and Humanities Research Council] buying the creationist ploy of intelligent design, a shallow and obvious strategy to bring religion into the science classroom?

Gary Bauslaugh is the editor of Humanist Perspectives *in Duncan, BC, Canada. He can be reached at editor@humanistperspectives.org.*

science—even many creationists would agree with that. But is it an idea that is more scientifically sound than intelligent design? Apparently the SSHRC adjudication committee didn't think so.

This SSHRC-induced fiasco has endured for well over a year now with the agency steadfastly refusing to retract or explain the position of its committee in regard to intelligent design. Representatives of the SSHRC have tried various gambits to take the heat off. They have repeatedly said that Alters could always reapply, but that is not the issue. They have frequently made reference to their statement about evolution, but that too avoids the point of concern.

Early in the controversy, instead of simply saying that the committee had erred in its equation, various SSHRC spokespersons only made matters worse. Janet Halliwell, who at that time was SSHRC's Executive Director, said:

> there is a growing belief among scientists that certain phenomena in the natural world may not be easily explained by current theories of evolution. The Research Council supports 'critical inquiry' that challenges scientific doctrine . . . we don't make any blanket assumptions.

A similarly troubling statement was made by Larry Felt, a sociologist from Memorial University in Newfoundland, who was the only member of the adjudication committee to comment publicly:

> No one is disputing the theory of evolution . . . a powerful tool not without some difficulties, but nothing that renders it obsolete . . . there are features of the natural world including the rapid development of complex organs that evolution has some trouble accounting for.

In responding to my correspondence to him, Felt referred to that "one damn sentence" that caused all the trouble (the sentence equating evolution and intelligent design), as being "just one of those unintended bit too general statements that opened up multiple interpretations. . . ." On the contrary, as I wrote back to him, "the problem is the exact opposite of that. The 'damn sentence' can mean only one thing—that ID has as much validity as evolution. That is why it is so disturbing to so many people, and that is why so many of us want an answer."

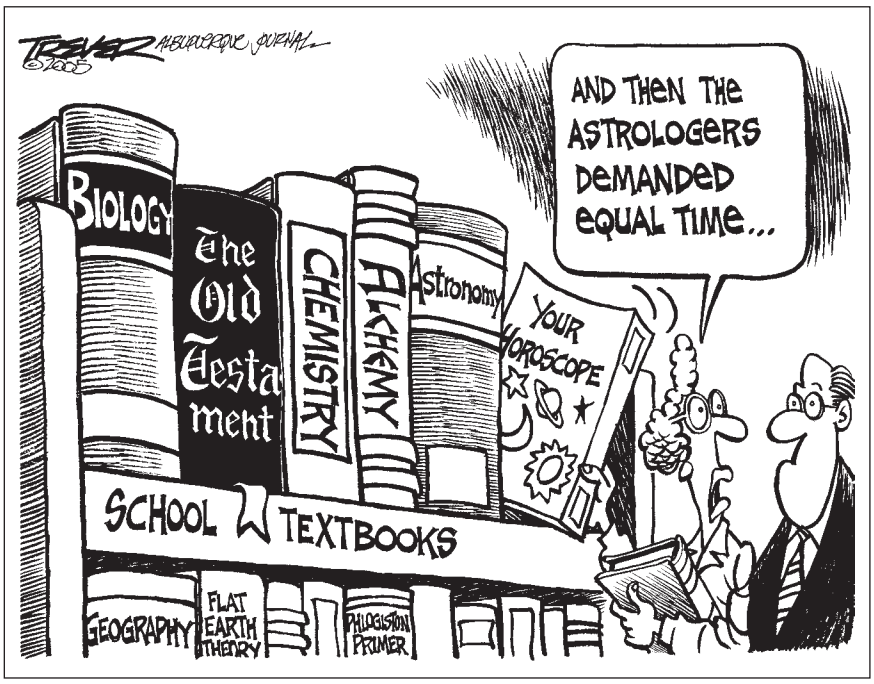
We are still waiting for one. Various groups, such as the American Sociological Association, the Canadian Society for Ecology and Evolution, and the American Institute of Biological Sciences, as well as many individual scientists in Canada and elsewhere, have expressed their concerns to SSHRC, but to no avail. Prompted by the SSHRC affair, one of Canada's most prestigious scientific associations, The Royal Society of Canada, issued a statement clearly differentiating the religious idea of intelligent design from the scientific idea of evolution.

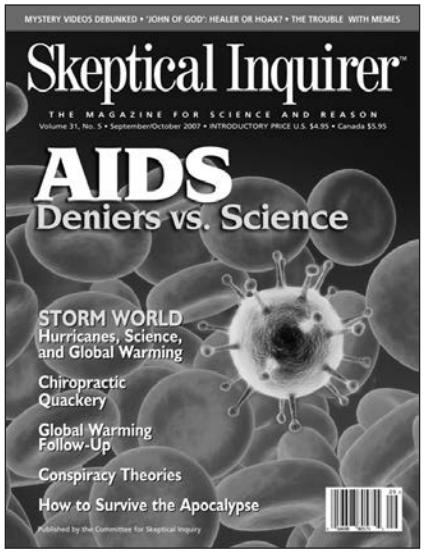
SSHRC, however, refuses to address the issue of intelligent design and exacerbates its reluctance to do so by arguing that its role is "not to enter into debates on the issues," which suggests that there is indeed a legitimate debate on the matter. This is fully in accord with the strategy of the creationists, who argue that there is a legitimate scientific controversy and that because intelligent design and evolution are equally valid theories, both should appear—side by side—in school science curricula.

Are the people at SSHRC fundamentalists? This is unlikely, although some have suggested that SSHRC, a federal government agency, may be acting under the influence of Canada's current right-wing government. More likely, I think, is that this large public agency is in thrall to certain trendy ideas in the social sciences and humanities. There clearly is a large postmodernist contingent in those circles in Canada, as in the United States, which holds that science is an ideology no better and probably worse than other ways of knowing.

One insightful columnist in Canada, in reporting on the SSHRC affair, referred to an "unholy alliance" between the academic left and the religious right. My guess is that something like this is happening at SSHRC, which unfortunately remains firmly in control of research funds for science education in Canada.

So, sadly, there is no victory here at all. This entire affair has been chronicled in detail in several issues of the magazine *Humanist Perspectives*, and the complete text is available under "Collections" on our Web site, www.humanistperspectives.org. □




MYSTERY VIDEOS DEBUNKED • "JOHN OF GOD": HEALER OR HOAX? • THE TROUBLE WITH MEMES
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AIDS Denialism

"AIDS Denialism vs. Science" by Nicoli Nattrass (September/October 2007) should have addressed Peter Duesberg's key assertion that the typical 1980s AZT drug regimen was often lethal. AIDS is often attributed to this iatrogenic harm by those who deny HIV causes AIDS.

I was skeptical about AZT prior to 1996. AZT made everybody I knew sicker. Only those who quit taking it survived past 1996 when patented anti-retroviral drugs started being prescribed in combination with much lower doses of AZT, and the death rate of HIV-infected people plummeted.

Until recently, Africa could afford only AZT due to the high cost of patented drugs. Although South African President Thabo Mbeki may have refused help for the wrong reasons, he was right to be skeptical about using only AZT.

I don't blame anyone for providing AZT or taking it, because I painfully recall when gay men were desperate for a cure. However, refusing to acknowledge its harm will only create more AIDS deniers.

Thomas Kraemer
Corvallis, Oregon

Nicoli Nattrass responds:

Zidovudine (AZT) was approved as the first therapy to treat AIDS after a clinical trial found that only one out of 145 people treated with AZT died within six months compared to nineteen deaths out of 137 people taking the placebo (Fischl et al. 1987). Although the drug resulted in side effects ranging from headaches to severe bone marrow suppression (Richman et al. 1987), this and subsequent studies confirmed that those on AZT survived longer than those not taking it (e.g., Stabbuk et al. 1989). The Concorde study (which sought to test when AZT should be provided) concluded that there were no benefits for those taking the drug before becoming AIDS-sick (Concorde Coordinating Committee 1994). We know now that this is because people taking monotherapies like AZT develop resistance to the treatment. Today's standard of treatment is a triple therapy regime to help overcome this problem. It should also be noted that when AZT was originally prescribed as a monotherapy, it was prescribed in very high doses (1500 mg per day). Nowadays, it is prescribed in much lower doses (usually 500 mg per day). AIDS denialists like Duesburg highlight the side-effects of AZT and claim erroneously that AZT causes AIDS, while failing to engage with evidence showing that the benefits of antiretroviral therapy (longer life) exceed the costs (drug-related side effects).

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Decompression Quackery

Dr. Hall has done a service in exposing the quackery inherent in much of the chiropractic claim of effectiveness for "decompression therapy" ("Fix Your Ruptured Disk without Surgery?" SI, September/October 2007).

As a neurosurgeon with thirty-seven years' experience dealing in large measure with spinal disease in middle- and older-aged people, I see daily the waste of time and money with "methods" such as this. Claims that "decompression therapy" will be successful 86 percent of the time are utter nonsense.

I have two corrective comments, perhaps niggling: There is no reason to limit the straight-leg raising test significance to angles between 30 and 60 degrees—age and disc levels are more relevant to this test, as is the degree of irritation of the nerve root; and while it is true that discs that are bulging and not frankly ruptured will settle down for the majority of patients, much less commonly symptoms caused by disc fragments that are extruded into the extradural space will do so permanently.

A. Loren Amacher, MD
Lewisburg, Pennsylvania

Storm World

As a navigator typhoon chaser in the western Pacific in the 1970s, I made ninety-nine flights to the centers of typhoons and flew many more missions to areas that were developing into typhoons. We investigated many low-pressure areas that did not become typhoons, although they seemed to have all the ingredients. Some that seemed to have little potential became super typhoons.

I observed typhoons that stopped for many hours, that looped, or that suddenly disintegrated over open water. We were able to track—and much of the time to forecast twenty-four hours ahead—where a typhoon would go, but we were often wrong, and forecasts beyond twenty-four hours were, and still are, prone to error. However, as Mooney points out in "Storm World" (September/October 2007) we knew the conditions were favorable for a storm, but the mechanism itself was, and still is, a mystery.

As a skeptic, I can draw no conclusions from my experience, but I have great respect for the global engine that powers these storms. I'm sure our understanding of them will continue to improve, but I'm highly doubtful about our ability to do anything about them.

David E. Steiner, PhD
Lt. Col USAF (Retired)
http://home.comcast.net/~davidesteiner/C-130E.html

It's All a Conspiracy

This is in response to Chris Volkay's "Is This Article on Conspiracies Part of a Conspiracy?" (September/October 2007).

Conspiracy theories are just another way to find meaning. Most of us are so wrapped up in our routine and delicate existence

that we fall victim and embrace conspiracy theories for anything out of the ordinary. It also makes sense that there were so many conspiracy theories in the U.S. in the sixties, not only because of social movements, but also because of television. It's human nature to question. It's a necessity. We want to know why and how, and not just blindly accept what we are told, or even what we see. We start out that way when we are children. It's not until years later that we realize most of what we were taught may or may not be true. What better way than to question the new ultimate authority of television? Now more than ever, we are aware of just how much manipulation plays a role in mass media. I can think of several films that capitalize on this idea, ironically. We are so skeptical that we question our own questions.

Thank you, Chris Volkay, for furthering the discussion about skepticism. Anything that makes us think is appreciated.

Marion Jimenez
Los Angeles, California

Chris Volkay's note on the widespread belief in conspiracies was interesting. However, beside the public's general lack of skeptical thinking, one disturbing possible reason for belief in conspiracy theories was not mentioned. Conspiracies exist.

For every Kennedy assassination, Elvis sighting, or inner-city drug conspiracy, there are proven conspiracies like Watergate, Iran-Contra, or Enron. People, in and out of government, collude and conspire to defraud or manipulate. Though the government and other public institutions may seem inept and incapable of pulling off a conspiracy, it does not mean that there aren't those in positions of power who try. Contrary to Volkay's lack of concern for government conspiracies, we should be concerned about government conspiracies and fight for open government, the public's access to the legislative process, and our constitutional rights. Though there are crazy 9/11 conspiracy theories floating around the Internet, it does not mean there is not tremendous waste, fraud, and cover-ups going on in the White House and Congress. It doesn't mean that no-bid contractors weren't hired in the aftermath of 9/11.

Perhaps Volkay is in cahoots with the government to distract our attention from the nation's troubles. If so, perhaps he can shed some light on where Elvis is hiding?

Mark Moldwin
Culver City, California
Professor of Space Physics, UCLA

I enjoyed Chris Volkay's conspiracy article, but wish to make a few comments. Perhaps people are more paranoid and lean toward conspiracies because of the history they have had with their own government. Maybe there was no conspiracy to kill JFK, but there was a conspiracy to kill Lincoln. Maybe there was no conspiracy with the September 11, 2001, attacks, but there was a definite conspiracy with Watergate. We fall back on history, and we become suspicious.

Paul Dale Roberts
Elk Grove, California

Chris Volkay's description of the difference between deductive and inductive reasoning is so bad it's not even wrong. Deductive reasoning does not involve starting with a premise or hypothesis, then looking for pertinent information that you modify to suit your hypothesis, and then throwing out "all that doesn't fit." That's confirmation bias. Deductive reasoning, as any freshman logic student knows, involves reasoning from premises to a conclusion that one claims follows with necessity from those premises. Inductive reasoning is not "withholding judgment or theory, looking at all the evidence, and then formulating your belief or theory based on all of the available evidence—regardless of what you may prefer the evidence to say." That is a description of open-mindedness by a critical thinker. Inductive reasoning is arguing from premises to a conclusion you claim follows from those premises to some degree of probability (rather than necessity).

I'd let Volkay's errors pass except that he makes a number of assertions with such dogmatic confidence that somebody might read his article and think he knows what he's talking about.

Bob Carroll
Davis, California
rtc@skepdic.com

I am always a bit astonished at the vehemence some "skeptics" like Chris Volkay bring to the task of debunking any suggestion that President John F. Kennedy's murder may have been the result of a conspiracy. It seems to me that assuming conspiracy is the most rational course of action when a head of state is murdered until such is conclusively disproved. And this is because, throughout history, most political murders have been the products of conspiratorial plotting among political enemies.

Could it be that Volkay and others like him subscribe to a secular version of American exceptionalism wherein things like conspiracies happen in other parts of the benighted world but not in "God's own country, the good ol' U.S. of A"? Or could it be that "skeptics" like Volkay live in mortal terror of the possibility that existence and history are not transparent and that there might be things afoot in the world, very bad things, that they are not aware of and, hence, have no control over?

Michael Pastorkovich
Pittsburgh, Pennsylvania

Mr. Volkay talks of deductive reasoning, inductive reasoning, physics, and looking at all available evidence, yet he ignores the evidence that raises serious questions as to why the oil cartel in Washington, D.C., deemed it necessary to destroy evidence immediately after September 11, 2001.

Why was the metal from ground zero shipped out of the U.S. to be melted down? Why were truck loads of stone and dirt dumped around the Pentagon crash site? How could a commercial airliner disappear into an eighteen-foot hole in the wall of the Pentagon? Why, why, why won't the government release film of a 757 crashing into the Pentagon? How is it possible all the bodies were incinerated at the Pentagon, yet paper and wood failed to ignite?

There are a million questions around 9/11 that have not been answered, and Volkay failed to ask a single one. Given the fact that 9/11 was used as justification for the war in Iraq, I argue that Volkay has trivialized genocide.

You will receive many more responses on this issue. I suggest Chris Volkay consider writing fiction.

Mark Farris
Monroe, Michigan

Surviving the Apocalypse

A question, if I may, concerning Stephen T. Asma's extremely helpful article "How to Survive the Apocalypse" in the September/October issue of SI: In his final paragraphs, under the heading "The Book of Life," he suggests combing one's hair in bangs to cover up the "666" on the forehead: "bangs are always fashionable . . . so comb down the locks. . . ." This poses a serious problem for those of us with little or no hair on top of the head, and

I'm wondering if the author can offer suggestions for overcoming this challenge.

Kurt Youngmann
tgobbi@comcast.net

What?! No Loch Ness Monster?

Joe Nickell's piece on the latest Loch Ness hoorah (Special Report, "The Loch Ness Critter," September/October 2007) suggests a new career path for cryptozoologists. Perhaps they could be persuaded to study the animals that actually do exist that they find while searching for animals that don't exist (if you follow me).

For instance, I don't understand why the Loch Ness monster is inherently more interesting than the Eurasian otter (*Lutra lutra).* In fact, on several grounds, I'd argue that the otter is more interesting than the Loch Ness monster. *Lutra lutra* is the UK's only species of otter, but Nessie is just one of a number of monsters that have allegedly inhabited the British Isles, including the dragon, the wyvern, the wyrm, the werewolf, and the gwiber.

If it's rarity and elusiveness you're looking for, the otter qualifies here as well. Between 1950 and the early 1980s, otter numbers went into serious decline in the UK. A 1977-79 survey found only about 6 percent of the available habitat occupied. Otter occupation of habitat had increased dramatically by 2000–2002. But the "Fourth Otter Survey of England, 2000–2002" notes, "An increase in otter distribution cannot be directly translated into an increase in otter numbers."

So even on the scarcity scale, Nessie doesn't have much on the otters that are taken for him. Neither of them are seen very often.

Maybe it's Nessie's size. He's supposed to be big. But otters can be three or four feet long, which makes for a pretty big animal. *Lutra* also has his own legendary penumbra. They were featured in the book and movie "Ring of Bright Water," and Brian Jacques's popular *Redwall* series regularly features anthropomorphic otters.

So otters have size, charisma, rarity, and literary and legendary credentials. They are of an ancient and distinguished lineage. What, I ask again, does Nessie have that *Lutra* doesn't?

The otters have one other characteristic that recommends them over Nessie: They actually exist. And it appears from the reports of UK wildlife officials that they could benefit at least as much as Nessie from the funding and concentrated attention that monster researchers lavish on their invisible beast.

If otters aren't to their liking, cryptozoologists needn't focus on them. I'd argue that grizzly bears are more interesting (and nearly as rare, and god knows more dangerous) than sasquatches. . . .

Dan Whipple
Broomfield, Colorado

While I have had no difficulty with your skepticism about God, intelligent design, UFOs, faith healing, quack medicine, and kindred assaults upon reason, I fear this time you have gone *too far*, sir.

No Loch Ness Monster? Are you—mad? What cultural icon will you dare attack next? The Abominable Snowman? Huh? Have you no shame, no decency, no respect for monsters? I am saddened . . . what will the world be without its monsters? Of course there are always Republicans. If only you could prove that *they* are mythical.

Diane Morgan
Dcrocodile@aol.com

Gallup Poll: Suggestions

The results of another Gallup Poll are in (SI September/October 2007), and we've been shown, not surprisingly, merely what countless polls have more or less revealed over and over again: "what" people believe. This may be useful for tracking trends of thought over a period of time, but I think a far more useful approach would involve asking a crucial follow-up question: "Why do you believe what you believe?" Choices (much more delicately worded, of course) could include: (a) My parents have always believed it and that's enough for me; (b) I base my beliefs on newspaper articles and/or TV broadcasts I've read and/or watched; (c) It's just a gut feeling, no specific reason; (d) I read extensively on the subject and developed my beliefs based on that, etc.

A question like that has the potential to illuminate the core of why people choose to believe what they believe, thus providing some focus for us nonbelievers in the ongoing struggle to bring rational and scientific thought to the forefront of human consciousness.

Eric Kohler
San Francisco, California

Three times in the article "Gallup Poll Shows Splits . . ." the phrase "believe that humans developed over millions of years from less advanced forms of life" is quoted from the Gallup Poll. While I am a firm believer in evolution, I'm not sure we are more advanced than other forms of life. I think it was Mark Twain who asked about Man being the pinnacle of Creation, "I wonder who thought that up?"

It seems that whoever wrote the Gallup question thought of evolution as a march to reach a goal rather than a series of happy accidents that resulted in many forms of life, some more successful than others, but none "more advanced." I'm not sure how I would have answered Gallup's question.

Charles Hruska
Brooklyn, New York

In Defense of Memes

Massimo Pigliucci is quite right that memetics is in its infancy (SI September/October 2007), much as genetics was in its infancy in Darwin's time. But in pointing this out, he misses the point of memetics, which is not to provide a full explanation of groupthink any more than genetics in Darwin's time could address nucleic acids. Nor is it to provide a second example of Darwinism outside biology: In many places in the sciences in which a seeming order emerges from chaos, e.g., in the emergence of near-circular, co-resonant, and near-co-planar orbits of planetary systems, the statistical core of Darwin's findings are already in use. Rather, the point of memetics is to observe that, like the computers on which self-modifying "computer viruses" spread, we ourselves are fertile hosts for patterns which emerge from "the marketplace of ideas" ready to at least temporarily propagate themselves without regard for our well being, ever successively more optimized to exploit our natures for this purpose.

Memetics provides something difficult to find in other areas of thought: a coherent explanation for why irrational thinking persists. The most intractable forms of irrationalism spread in ways that attack our sense of self, natural ethical impulses, sense of community, and other weak points. Memetics points out that when one person says Zeus commands them to volunteer for the Red Cross and make side trips as a missionary for Zeusism, and another person says Mithra commands them to kill all

non-Mithraists, these are different strategies for the spread of Zeusism and the elimination of all competition with Mithraism, i.e., different forms of the same thing.

Matthew H. Fields
Ann Arbor, Michigan

Massimo Pigliucci criticizes memetics because its advocates supposedly "completely lack a functional ecological theory of memes" without which "the whole enterprise is scientifically empty." But Darwin also lacked a functional ecology of genes. In fact, actual genes, of the sort Pigliucci defines ("pieces of nucleic acids . . . with known physical-chemical characteristics"), were not discovered until long after he was dead, and after evolution had already been accepted as a valid science for decades. Historians of science point out that Darwin didn't even know the work of Mendel before publishing his theory of evolution, and yet Mendel did not solve the problem of animal genetics either, this being far more complex than the colors of peas. Hence, Darwin did not know what genes were or "what their physical basis is," and yet he demonstrated evolution by natural selection without this information.

In actual fact, we do have a functional ecology of memes. It is described presently in at least two scientific fields—sociology and cultural anthropology and has already been converted into a predictive technology in the fields of marketing, economics, and communications science. Anyone who has read Lakoff knows that we can and do predict, even scientifically, which memes will survive in which environments. Historians of ideas are formulating hypotheses about this all the time (Why was Nazism so popular in Weimar Germany? Why was the Scientific Revolution successful? Why are Western democratic ideals failing to spread in Iraq? Why is the least efficient keyboard layout so popular we can't even replace it?).

Consider the scientific work done lately on urban legends, which has defined story units and mutations and analyzed the reasons why some legends flourish and change in one way rather than another, and why other legends are stillborn or become timeless. Even when you know in everyday life who will believe a story and who won't, who will resist an argument and who will be persuaded by it, you are making predictions based on the ecology of memes.

There is no doubt that memes reproduce, mutate, and undergo selection. This has mathematically inevitable consequences regarding their propagation over time, as their selection is not random (though, unlike genes, neither is their mutation). Instead, memes experience an ecological environment of favorability and unfavorability that affects their survival, as anyone can see who notices that some brilliant ideas don't catch on while many stupid ones become popular. And we do know their physical basis: language and neuron organization, hence the scientists that study both are studying memes. . . .

Not knowing the exact underlying details of how intelligence is genetically realized and evolved is not seen as a scandal by Pigliucci. So why should he see such a scandal in memetics? Compared to the state of genetics in 1870, memetics is way ahead of the game.

Richard C. Carrier
http://richardcarrier.blogspot.com

Massimo Pigliucci responds:

I think both writers have missed the point of my criticism of memetics: I never said that it fails because it cannot account for the physical basis of memes (although this is not a minor problem). Rather, memetics fails because it does not provide an explanation of anything, unless one counts restating the already known facts as an explanation.

To say that Mithraism and Zeusism spread because of the Mithra and Zeus memes, as Matthew Fields suggests, is to say precisely nothing unless one is prepared to provide what I called an ecological theory of memetics: why were the Mithra and Zeus memes successful in a particular cultural environment, but they are now essentially extinct? Darwinism succeeds because Darwin didn't just say that natural selection favors the survival of the fittest, defining then the fittest as those who survive. He painstakingly built ecological (testable) hypotheses for why certain variants of animals and plants are more likely to survive and reproduce than others. Without ecology there is no evolution.

Richard Carrier comes closer to appreciating my point about ecology, but then he claims that I want an ecological theory of genes*, which I agree Darwin certainly didn't have (I have actually studied a bit of the history of biology myself). However, Darwin did have an ecological theory of* phenotypes*, which is what makes the claim of natural selection noncircular. Similarly, I am not asking why the physical basis of certain memes (whatever they might be) function the way they do. I am asking for why certain memes' phenotypes (i.e., tunes, ideas, behaviors, etc.) are or are not successful in the supposed struggle with other memes. No such explanation has been forthcoming from any memeticist.*

Finally, when Carrier says that a functional ecology of memes is provided by sociology and cultural anthropology, he makes my point splendidly: those fields did not need memetics to produce said theories, and to substitute "meme" for "idea" adds nothing at all to their explanatory power.

Let's Learn to Live with Global Warming

Global warming, whatever the cause, is apparently a reality, and we will have to learn to live with this reality.

Corey Binns, writing in the July-August *Natural History* magazine, citing the work of Michael Storey in Denmark, notes that fifty-five million years ago the Earth warmed sharply, some nine degrees Fahrenheit, possibly because of volcanic activity heating organic-rich marine sediments and sending 1,500 billion tons of carbon into the atmosphere. These greenhouse gases were released over a period of twenty thousand years, but it took more than two hundred thousand years for global temperatures to return to normal. Today, according to Storey, the burning of fossil fuels is releasing greenhouse gases at a faster rate than happened fifty-five million years ago.

Even if we could confirm the allegations that the present warming is mankind-induced, and even if we could successfully accomplish all the efforts that activists recommend to reduce manmade emissions, and even if no complicating geologic factors were present, it would still probably take centuries to bring global temperatures back to "normal." So, assuming no confounding geologic factors, we must learn to live with global warming.

There are more important issues to resolve if humanity is to live on. Genetic traits that were useful to the Neanderthals and the mammoths for survival may be pushing us to self-destruct, and civilizing programs are needed to rein in these drives. Population must be controlled: technological advances (medicine, food supply) have led to vast increases in population, but technology would be better used to reduce procreation. Another problem is the divinely inspired and sanctioned murder of persons that are not inspired by your divine.

Pressures induced by burgeoning population in the face of reduced resources, exac-

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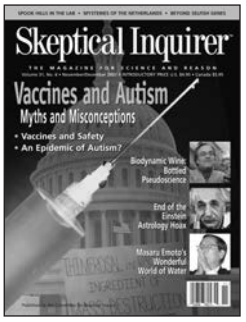
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erbated by religious and political fanaticism and bolstered by a frightful and ever more available weapons technology far exceed global warming as a threat to humanity.

Marvin J. Schissel
chicschiss@aol.com

Psychology as Science

While checking out the New Books capsule summaries in the September/October issue of SI, I discovered, in the description of Weidhorn's *An Anatomy of Skepticism*, that psychology is a "nonscientific discipline," similar to religion, politics, history, literature, and reason. This will come as a shock to my department colleagues, all of whom publish in scientific journals.

Jeffrey B. Brookings
Professor of Psychology
Wittenberg University
Springfield, Ohio

'Middle Ground' Muddled?

Janet M.C. Tanaka's letter regarding the "middle ground" between Fundamentalists and "noble scientific antireligion nonbelievers" (September/October 2007) begins reasonably enough, but closes with a question that I think demolishes much of the original argument.

"[H]ow would you explain biological evolution and plate tectonics to a bunch of—by our standards—sheepherders?" Tanaka asks. This would seem to be the wrong question. To my way of thinking, the real question is, "If God (or whatever) was interested in humans understanding such concepts, why would he/she wait until relatively recently in human history to reveal such information?" What purpose is served by keeping humankind in the dark for so many millennia? If God can only "speak to his/her prophets in a language that was appropriate to their times, places, and understanding" doesn't that (a) detract from the notion of God as supernaturally powerful, and (b) suggest that God was purposely keeping from us the very knowledge which we now find so useful?

Tanaka's position suggests many problems and questions. What purpose was served by keeping humans in the dark for so long about the true origins of species, the shape and makeup of the Earth and the solar system, the reality of physics, etc.? By what mechanism are modern humans able to grasp concepts that our ancient forebearers could not? Has God improved our brains since ancient times? Doesn't it seem unlikely (and more than a little cruel) that God would now smile upon us gaining knowledge which he/she spent millennia keeping from us?

Adam Zar
Madison, Wisconsin

Why Do I Call Myself a Rationalist?

I have been a convinced and committed atheist since my pre-teens, for more than half a century. But I have long resisted (and resented) being defined by what I *don't* believe. A proliferation of terms for nonbelievers now affords me an opportunity to apply a more simpatico self-descriptive.

My problem with "humanist" is that humanism seems to have expropriated atheism in pursuit of an ultraliberal political and social agenda with which I may not (necessarily, at all times) agree. Terms like *freethinker* and *Brights*, though I may accept their tacit premise, seem gratuitously condescending and confrontational. *Skeptic*, yes, but too often it's confused by too many with cynic. *Agnostic* is considered a cop-out—fence-straddling—by many militant atheists. I disagree: Agnosticism is about what one *knows*, or professes to know; atheism is about what one *believes.* When atheists, enamored of their self-rectitude, fail to recognize or allow any distinction between their knowledge and their belief, they, like the religious fanatics they rail against, become zealots.

So, I *am* reluctantly agnostic (an agnostic-atheist): I concede that I do not, can not, *know* (for sure, to an absolute certainty), despite the vast preponderance of credible evidence that validates my view beyond any *reasonable* doubt. Aha! I call myself a rationalist because that designation best describes what I *do* believe in—I fervently believe in reason.

Richard M. Cooper, MD
Ventnor, New Jersey

'Fine-tuned' Argument Self-Defeating

I am concerned over the growing number of poor responses to the theists' argument of "fine tuning." Rather than confront the flawed logic of the argument, the common response is to speculate why the constants are what they are. This is a miscalculation that leads the theist to believe that he/she has a point to be addressed. Consider that if the range of life-hospitable values is such, then a designer would be bound by these restraints in his design. This would imply a designer is not above the laws of physics and mathematics, which raises suspicion about the existence of any designer at all. If, however, a designer is believed to be above the laws of its design (which it must be), then the specialty of the range and values of life-hospitable constants is null. The designer would have arbitrarily chosen any range, value, or relationship to facilitate life. Thus, if there is a designer, then the constants of nature hold no specialty. Therefore, the "small" range of life-producing constants neither implies nor concludes anything in reference to a designer. The argument of a "finely tuned" universe is self-defeating.

Roman Swiatkowski
Hammond, Indiana

Mistaken Geology?

I read with interest the article "Betty Hill's Last Hurrah" by Robert Sheaffer (SI September/October 2007). I've spent a lot of time in that part of New Hampshire but never knew of this incident. In the closing paragraph, the author wrote that the "Indian Head itself has collapsed." It has not. New Hampshire's famed "Old Man of the Mountain" collapsed in 2003. However that is not the same geological formation as the Indian Head.

Dave Kurdzionak
Stoneham, Massachusetts

In the last paragraph of Robert Shaeffer's interesting column "Betty Hill's Last Hurrah," Shaeffer states that "Indian Head itself has collapsed." As someone who regularly performs at the Indian Head Resort, I can affirm that the Indian Head is still in good form "watching" over the landscape.

In fact, it was the "Old Man of the Mountain," New Hampshire's State Symbol, that collapsed on May 3, 2003 (not 2004, as Shaeffer wrote). The collapse of the Old Man still causes grief to me when I drive through Franconia Notch and note its absence. While they were in the same region and less than a mile or so separated the peaks (as the crow flies), the two didn't mix socially and likely had no opinion on the goings-on of the

minuscule creatures gathering at their base.

The Indian Head Resort certainly continues to benefit from the story of Betty and Barney Hill, and Kathy Marden (Betty's niece) will be signing copies of her new book at their "Psychic Weekend" in early November.

Andrew Pinard
Bradford, New Hampshire

Robert Sheaffer responds:

What Dave Kurdzionak and Andrew Pinard point out is indeed correct. For what it's worth, the Hills' UFO was reported to have also passed behind the Old Man of the Mountain. □

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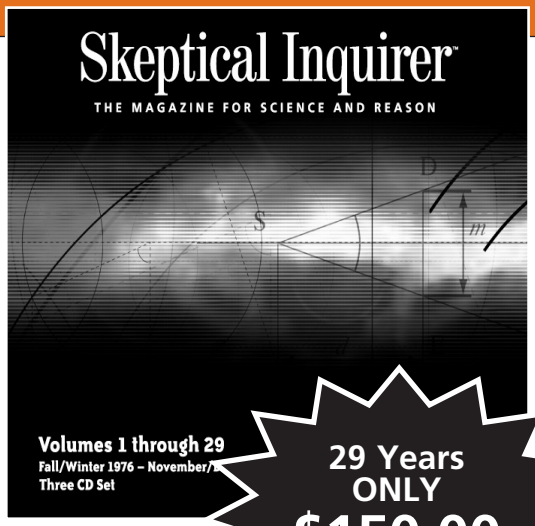

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